

THE ENGLISH VEGETABLE GARDEN

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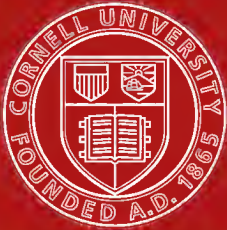
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THE ENGLISH VEGETABLE GARDEN



VEGETABLE MARROWS UNDER GLASS IN ALDENHAM HOUSE GARDENS, ELSTREE.

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THE ENGLISH VEGETABLE GARDEN

WRITTEN BY EXPERTS

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INTRODUCTION

NONE of the products of the garden have a greater value than vegetables, if these are cooked and eaten while fresh ; if, however, their transit from the garden to the table is delayed, as inevitably it must be when the vegetables have to pass through the hands of several dealers before they finally reach the consumer, they lose some at least of their best qualities. There is no comparison, either as regards their palatableness or health-giving qualities, between vegetables freshly gathered and those that have passed through the hands of the grower and the wholesale salesman and are finally bought from the greengrocer. Every one then who has a garden, even if it is small, should devote at least a part of it to the cultivation of vegetables ; he will be the gainer thereby in more ways than one.

The aim of this book is to show how any one

having the land at disposal may produce his own vegetables, and by storing through the winter and by forcing, in addition to growing the summer crops in the open garden, may have good home-grown produce on the table the whole year round. They who delight in growing vegetables for exhibition will find the special methods of cultivation fully described, while those interested in the rarer vegetables (many of which, although most palatable and even delicious, are sadly neglected), in herbs and salads, may consult the following pages with advantage. It is not always wise to recommend new varieties of vegetables, even though they are put on the market with a flourish of trumpets, so that in the various chapters and tables only those are mentioned which, after trial, have been found to be superior to certain existing sorts, in some way or another. Older varieties still worth growing have not, of course, been omitted.

While the value of fresh, home-grown vegetables cannot be too strongly impressed upon the public mind, it must not be forgotten that they are easily spoilt by bad cooking. It is notorious

how little variety there is in the English methods of cooking vegetables, and it is questionable whether even those in common practice are calculated to bring about the best results. In the hope that they may serve, if not to abolish at least to ameliorate some of the crude present-day methods of cooking vegetables, and perhaps to induce a trial of other ways, chapters upon the subject are included: they contain a description of the methods practised by the best French and English cooks.

It is hoped that the tabulated lists towards the end of the book, stating the time to sow seed and to plant, and giving the best varieties of each kind of vegetable, will be found useful. They contain much information in a small space and this is presented in such a form that the reader may comprehend it almost at a glance.

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CHAPTER I.

FORMATION OF THE KITCHEN GARDEN.

SEVERAL important points must be considered before beginning to make a kitchen garden. The work is permanent, as the kitchen garden should last for generations and under right management continue to produce satisfactory crops over a long period. Scampering will result in failure. A solid foundation must be laid.

Situation.—This has a great influence upon the successful culture of vegetables, and too much consideration cannot be given to the selection of a suitable site. To some extent the climate and natural conditions of the district in which one is placed will govern the choice of position. It will be well, however, to consider first the general principles that should underlie the making of a kitchen garden. It must not be formed altogether on sloping ground, although some portion of it should be. On a slope the crops will probably suffer from want of water during a dry summer, for instead of remaining within reach of the roots of the vegetables, the water will drain away to the foot of the land. Make a point therefore of choosing a piece of land that is not all sloping. The object

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of having a certain portion of the kitchen garden on sloping ground is to make provision for the cultivation of an early supply of vegetables, as a sloping south border is more easily and quickly warmed by the sun than level ground. It may not, however, be easy for the maker of a kitchen garden to procure a piece of land that has both the advantages mentioned, but rather than not have the greater part of the land level, one should dispense with the sloping portion, for a border facing south can always be raised somewhat to make it warmer and more suitable for the culture of early vegetables. If the land upon which the kitchen garden is to be made is heavy, a slight natural slope would be an advantage, as in a great measure it would prevent the ground remaining wet and cold. On the other hand, light and porous land from which water readily passes off should on no account be even slightly sloping.

Except in the southern counties the kitchen garden should face south. In these exceptionally favoured districts full exposure to the summer sun would perhaps be a disadvantage, especially in unusually hot and dry seasons. Watering would entail much labour. Rather than face due south, the kitchen garden should in these cases face south-west.

The kitchen garden should be of oblong shape, and its greatest length from east to west, not from north to south, thus there will be a greater surface of beds exposed to the south than if the garden were longer from north to south. The beds facing south in

that case would be narrow, and those with an eastern and western aspect the more extensive. This would not be at all desirable, as sunlight is essential. The weather cannot be depended upon in this country, and spring is often a treacherous season ; this is the most important time in the kitchen garden, for then the majority of seeds are being sown and most of the plants got in. There is no more powerful stimulant to growth than sunlight. Shelter is a matter that must not be overlooked, and no better shelter can be wished for than that of hills and trees. It is always well to notice if there are hills in the neighbourhood offering a protection to the garden from the north and east, for such a protection is valuable. To form a kitchen garden in a position entirely unprotected by either trees or hills is unwise. Although trees may be planted, many years must pass before they are of use. Where plenty of large and established trees such as Elms, Beeches, Oaks and Limes already exist there will be no need for further planting, but where these are not numerous, perhaps existing as isolated specimens here and there, more planting should be done. The best trees for shelter outside the kitchen garden are Lombardy Poplars, Austrian Pines, Limes and Larches. The Poplars, Limes and Larches are, of course, deciduous, but if planted close together soon form a good screen. The points at which shelter is most required are the north and east. It is from these quarters that the cold cutting winds blow in the spring, and the tree shelters are more necessary for protection from these winds than for

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any other purpose. Shade is not required, so plant away from the trees. And there is another disadvantage, *viz.*, the tree roots rob the soil of that goodness necessary for the vegetables.

When possible a good eight or nine feet wall is what is required, and before making the garden visit one or more of the many splendid kitchen gardens that exist in this country.

The Soil.—When considering the selection of a suitable site for the kitchen garden, bear in mind the importance of having land that either is or can easily be made suitable for the purpose. Soil, however, can be ameliorated by skilful treatment, situation cannot. The best soil for a kitchen garden is a good depth of rich loam, with a porous subsoil that allows superfluous moisture to pass away gradually. Soils in which either clay or gravel greatly preponderates should be avoided, for to bring either into a condition to produce satisfactory crops of vegetables would take a considerable time. Clayey soil has the disadvantage during late autumn, winter and early spring of becoming wet and cold and is therefore altogether unsuitable for the vegetables. Such land is also difficult to till ; it quickly becomes wet and sticky after even a little rain, and to either trench or dig ground when in this condition is almost impossible. When dry the masses of soil are hard and crack, making it impossible for roots to live. Gravelly soil also has serious disadvantages, it is dry and “hungry”. To ensure even a moderate crop from it much water and manure are

needful as most of the moisture it may receive, either by rain or artificially, passes away without greatly benefiting the crops ; thus watering and mulching become essential. A gravelly soil is naturally wanting in plant food, so that roots of plants must be nourished by manures artificially given. Light and poor land, such as that under consideration might well be called, is expensive to cultivate, and, even when every attention has been given it, the crops obtained would probably not be so good as those upon more suitable land with half the labour. The cases above drawn of these two kinds of soil are, one should remember, quite extreme ones. Knowing the disadvantages of both heavy and light land it will be advisable to see how each can be improved, for it is more than likely that the majority of prospective kitchen gardeners will have considerably to change the condition of the land freshly brought under cultivation before they are able to obtain the best results. We will first consider the best methods of

Improving Heavy Land.—This soil is too close, stiff and retentive of moisture, and such additions as lime, brick and mortar rubble, burnt clay and refuse, ashes, coarse sand and other materials should be made. Much good will also come from roughly digging it in the autumn and leaving the large unbroken masses of soil exposed to the frost, rain, and snow of winter. In the spring it may be broken up and prepared for planting with little trouble, the action of the frost, etc., rendering the soil quite friable and easy to work. To

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give stability to light hungry land incorporate with it materials that contain plant food, such as road scrapings, wood ashes, garden refuse, farmyard manure and dead leaves. Both these and the materials recommended for heavy land are best applied in the autumn ; spread them over the land and thoroughly dig them in. There is no better or more economical way of disposing of cabbage stumps or other greens that stand in the way of preparing the ground for spring planting or sowing than to bury them in trenches deep enough to make sure that they will not come directly in contact with the roots of growing crops. They will in due course decay, and add much to the value of the soil, particularly if light.

The value of a refuse heap is often under estimated by the kitchen gardener ; properly attended to, it forms an excellent plant food. It is easily made, and is undoubtedly of great help to the land, especially to that wanting in retentiveness. The refuse heap may consist of old soil, dead leaves, road scrapings, the stems and leaves of pot plants or vegetables, lime, mortar rubble, or in fact any garden refuse ; an occasional application of soot or liquid manure is a great improvement. Such a refuse heap should, from time to time, be thoroughly turned, and valuable ashes will result from the burning of dry portions. It must not be assumed, however, that heavy land does not require manure. It may be just as deficient in plant food as that of quite a different nature, but even good land must be manured to replace the nourishment taken

from it by growing crops. Continually to cultivate vegetables upon any soil, and to neglect to manure the latter, would result in bringing about a greatly impoverished garden.

No operations help the cultivator of vegetables more than digging and trenching. Trenching involves much time and labour, but must be done if the garden is to be well maintained. It is not necessary to do much of this work at once if a certain part be regularly trenched every year, and this is the practice that should be followed. The gardener will have no difficulty in knowing which portion of the grounds to deal with, for the disposition of the crops will govern this. The great value of trenching is that it exposes fresh soil to the ameliorating influences of the rain and atmosphere, brings fresh material to the roots of plants, and gives a rest to the remainder of the soil. Trenching is performed as follows: The land to be trenched should be equally divided along its greatest length by a line or by a mark made in the soil. Then at one end of one half the ground remove the soil to the depth of either two feet or three feet, and place it near the same end of the other half. This will be clearly explained by the illustration on page 8.

If the land has never been trenched before remove the soil two feet deep only, and then well dig the bottom thirteen inches deep, thoroughly turning it over instead of removing it altogether. When the land has been trenched previously, then begin by

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taking out three feet of soil, and place it as above directed, thoroughly stirring the bottom of the trench. Sufficient soil must be removed to open a trench two feet wide. The surface soil of the next two feet (marked No. 2 on the plan) and to the depth of twelve inches is then placed at the base of the opened

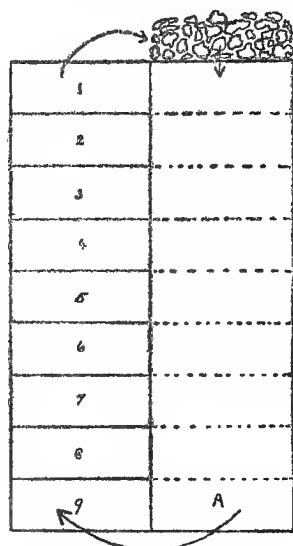


DIAGRAM SHOWING HOW TO TRENCH.

trench (marked No. 1) The second layer twelve inches deep (of No. 2) is then thrown upon the top of the first, thus making the soil in trenches Nos. 1 and 2, of the same height. The last twelve inches of soil in trench No. 2 is then placed upon the top of the second layer in the first trench, thus bringing this

again to its normal level, and leaving the other one empty. The worker will now be in a similar position as when he commenced, except of course that he will have progressed one stage towards the completion of his work. He will still have an open trench before him, and this must be filled from the two feet wide space marked No. 3, in exactly the same way as trench No. 1 was filled from No. 2. Proceed in exactly the same way until the eighth trench has been opened and filled. Trench No. 9 must be filled from soil from the same end of the next half of the ground, marked A on the plan. This portion of the land should be treated exactly as the first, the only difference being that the operator will now work in an opposite direction to that in which the other half of the ground was trenched. In due time all the trenches will have been opened and filled too with the exception of the last. Now the soil previously removed from the first trench on the other half and placed alongside the last trench (now empty) will of course be used for filling it, and it should have been before mentioned that in removing this soil, care must be taken to keep each layer distinct, so that they may be placed in the trench in the manner practised throughout. To carry out trenching well each spadeful of soil should at the same time as it is displaced be also turned over ; if this is not done trenching loses much of its value.

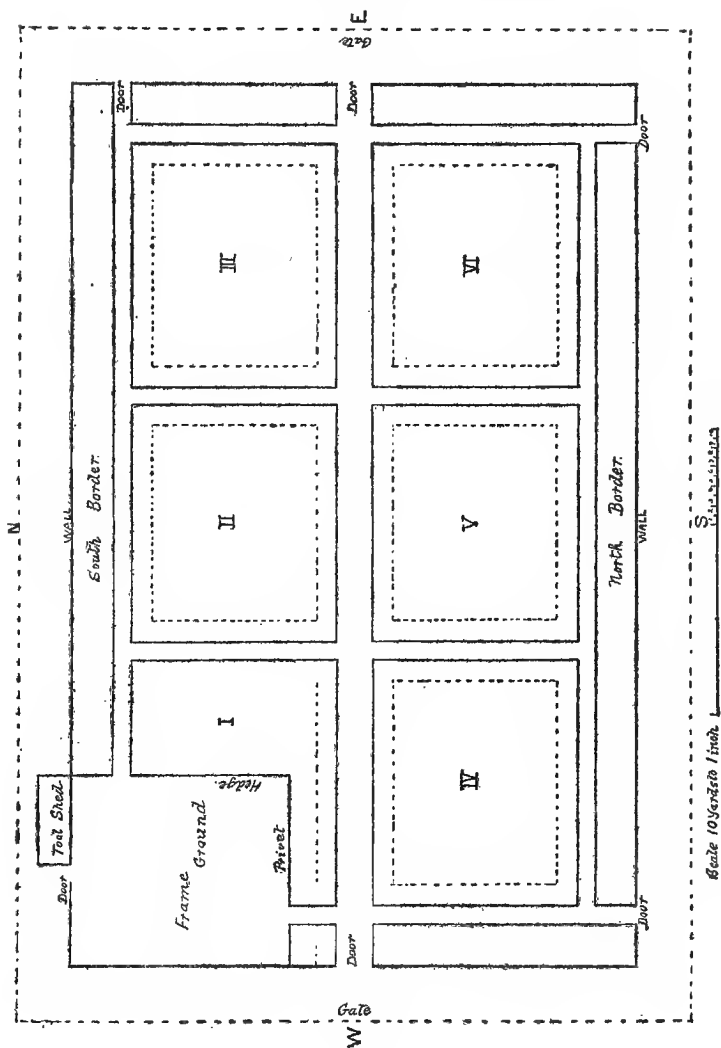
When the land has not been trenched before, and two spits each twelve inches deep were removed instead of three in the first place, this practice would of

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course be continued throughout the plot of ground ; the third layer instead of being removed would simply be well turned over. It is only necessary to divide the land in the manner shown when it is too wide to be conveniently worked at once. With a narrow plot of ground this would be altogether unnecessary.

Laying out the Garden.—Having secured a suitable site where the land is either good or can be quickly made so, consider its formation. The first thing that naturally suggests itself is the size. Frequently there is no choice in the matter, but to those who have plenty of ground at command, a little advice may be given. It is a great mistake to have a kitchen garden so large that it cannot properly be attended to. The land will be not only partly wasted, but probably none of it will be well cultivated, and the result is a series of unsatisfactory crops. The plan of a kitchen garden that accompanies these notes represents about one acre of land. This space may be said to provide sufficient work for a man and a strong boy. For an acre and a half to two acres two men would be necessary, and for every additional acre another man. Such a calculation forms a rough guide for one to work upon. If the kitchen garden is only a half or three quarters of an acre in extent then occasional assistance should be sufficient to ensure its proper cultivation.

To some extent the form of the kitchen garden has already been shown. It has been mentioned that in shape it should be an oblong, the greatest length



PLAN OF KITCHEN GARDEN.

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being from east to west, so that the greater portion of the land may have a southern exposure. If at all possible, the kitchen garden should be surrounded by walls. It *must* have an enclosure of some description, and although walls are expensive to build, they will, if properly managed, in time amply repay the expenditure. They are valuable as shelter to the vegetables, and provide a surface against which can be grown a great variety of hardy fruit trees ; indeed it is only against walls that several of our choicest fruits can be grown out-of-doors in this country, and the farther north one goes the more necessary walls become. Hardy fruit and vegetable culture are inseparable, and can be economically carried out together, so that the planting of a hedge around a kitchen garden to afford protection to the crops within, instead of a wall, is false economy. The walls around some of the best kitchen gardens in the country are 12 feet high and 1½ feet through, but in smaller gardens such are unnecessary. To be of real value, however, they should not be less than seven or eight feet high. Adequate protection must be given to fruit trees against the exterior of the garden wall, and this cannot be better provided than by planting a hedge of Thorn or Holly say at a distance of about eight yards. If it is necessary specially to protect the garden, a good way of doing so is to make a deep ditch all round and plant the hedge upon the top of the bank nearest the wall. Cobbett's *English Gardener* contains a note about this that is worth reproducing. " You make a ditch six

feet wide at the top, and two and a half wide at the bottom. I suppose the ground to be trenched to the width of eighteen feet from the wall. You take all the good earth from the top of the place that is to be the ditch, and lay it upon the trenched ground to the extent of two feet wide which will make a very good and deep bed of earth for the plants which are to form the hedge to grow in. Then the ditch ought to be dug out to the depth of three feet, and shovelled out very clean and smooth at the bottom. This bottom earth of the ditch must be carried away, for it would not do to carry it up into the border. If it be convenient the slope of the bank ought to be covered with turf, well beaten on and in the autumn ; because if put on in the spring, the grass would be likely to die. If not convenient to get turf, the slope ought to be thickly sown with grass seeds from a hay loft ; and in both cases this slope of the bank ought to be hung very regularly with dead bushes, fastened to the bank by little pegs. This bank and ditch alone, if the bushes were well hung and fastened on would be no bad protection ; few boys or young fellows would venture, particularly by night, to take a jump over a ditch of six feet, with about two feet of elevation on the bank ; but the hedge in addition to this ditch and bank, renders the storming literally impossible, except with the assistance of fascines and scaling ladders, which are munitions that the besiegers of gardens are very seldom provided with." This extract will show that Cobbett considered protection most necessary for

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the kitchen and fruit garden in the early part of the nineteenth century, and may help those who are still of his opinion. He says further, "Resolve to share the produce of your garden with the boys of the whole neighbourhood, or keep it for your own use by a fence they cannot get through, under or over. I really feel some remorse in thus plotting against the poor fellows, but the worst of it is they will not be content with fair play ; they will have the earliest in the season and the best as long as the season lasts, and therefore I must, however reluctantly, shut them out altogether."

It is not wise to plant the hedge round the garden until the interior is finished, for there will be much wheeling of soil and gravel, etc., and the hedge would probably prove a nuisance and almost certainly become damaged.

In laying out a kitchen garden bear in mind that convenience is an important point, and that the simpler the design the more easily can the work be carried out, resulting in a saving of both time and labour. The design of the vegetable garden must be formal, with simple walks that enable the gardener to pass quickly from one part to another. Running through the centre of the garden, and along its greatest length, should be the main road, sufficiently wide to admit of the passage of carts.

By this means soil, manure or whatever material may be required can be brought direct to any one of the chief plots in the garden. In kitchen gardens less

than one acre in extent a road made sufficiently wide to admit carts would be unnecessary ; the size of the ground under cultivation would not warrant the trouble and expense entailed. All the necessary materials for the land could be carted to the entrance, there deposited and transported in a wheelbarrow to any part of the garden where they might be required.

In addition to the main central road (which if it is to admit horses and carts should not be less than nine feet wide), as many smaller paths as are considered necessary to allow of convenient access to every part of the garden should be made. In the first place there must be one all around at such a distance from the wall as to leave a border wide enough for the proper accommodation of the roots of the wall trees. These borders, as will be more fully explained later, will be very useful for vegetables, and being protected by the walls, with a south, east, west and north aspect respectively, they are most valuable to the kitchen gardener. It is from the south border that early vegetables will come, and in prolonging the season of any particular product, the north border is of only second importance. Having the main central walk and the smaller walks running parallel with the walls, other small ones will also have to be formed to divide up the remaining land into convenient plots. In the accompanying plan there are really three plots upon either side of the middle road although, practically, one of these is absorbed by the frame ground.

In laying out the kitchen garden it is essential

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that the formation of walks, borders, etc., be done with great exactitude, otherwise the result will be disappointing ; it is therefore needful to have a plan accurately drawn to scale.

Edging for the Walks.—The beauty of the vegetable garden depends in a large degree upon the nature of the edgings. Tiles are a mistake, as they are easily broken, and always apt to be accidentally knocked by wheel-barrows, carts, etc., while they always have a hard, and even ugly look. Grass edgings entail much labour to keep trim as they get trampled upon. A beautiful mixed border on either side of the centre walk is a great gain. It may contain a host of things for cutting and thus save the flower garden proper from disturbance.

Much may be said in favour of the Box as an edging ; it is evergreen, very hardy, of compact and pretty growth, does not harbour slugs, etc., to the extent that larger-growing plants do and is almost indifferent to soil. If properly clipped and attended to, a Box edging may remain undisturbed for twenty years or more. It should be clipped regularly and evenly in the early spring, and should again be gone over in the summer to remove any ragged or loose growths. Plant it close to the gravel, and so cover the bare stems that they are not visible when the planting is done. It should be three or four inches high when finished, and when established should not be allowed to grow more than about eight inches in height. A line will of course be necessary, so as to plant it quite straight,



JERUSALEM ARTICHOKE.



A ROW OF CARTERS' LEVIATHAN BROAD BEAN IN THE GARDENS OF
ALDENHAM HOUSE.

and the work should be done as soon as the walks are finished.

The *Frame Ground* is a necessary feature of every good vegetable garden. The frames will be useful for raising the young plants for producing an early supply of vegetables, for forcing such things as Asparagus, Potatoes, Carrots, Rhubarb, etc., and for maintaining a supply of Mustard and Cress, Basil and other Salads and Herbs during the early spring. It is here that practically all the propagation of early vegetables will be done. The frame yard also is a convenient place for storing manure, making hot-beds, refuse heaps, etc. A shed for the accommodation of the various tools made use of by the gardener is needed and should be made of such a size that soil may be stored in it. During wet weather men can work there. The walls of the kitchen garden must be covered on both sides with fruit trees of various sorts. Jerusalem Artichokes are suitable subjects for planting in the enclosure between the walls and the boundary hedge.

Cropping the Land.—As the cultivation of fruit trees is so closely connected with that of vegetables and of equal importance in the kitchen garden, a few words must be said with regard to them.

On either side of the large central walk there should be a row of fruit trees, Apples on one side and Pears on the other. The forms of trees known as bush and pyramid may be planted here, and they will in time form a handsome and valuable avenue,

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beautiful at all seasons, especially in spring and autumn. Plant at a sufficient distance from the walk to prevent at any future time their encroaching upon or overhanging it. By this practice not only does one obtain a considerable quantity of fruit, but practically little ground is occupied exclusively, for even underneath the trees such things as Strawberries, Parsley, Shallots, etc., can be grown with great success. If the garden is of fair extent and much fruit is required, plant bush fruit trees on one side also of the walk that runs round the garden, but only on one side, because the borders next to the walls must be left intact. Bush trees are the best for this purpose because of their compact growth. For planting by the sides of the minor walks or even upon the border side of the walk nearest the walls, use dwarf horizontally trained trees. These take up practically no room, give little shade and produce good fruit.

General Remarks upon Cropping.—Cultivation of the crops must be done systematically, and in a general way the gardener must know before the season commences which vegetable any particular part of the land shall be devoted to. Much can be done during the winter to determine how the ground may be cultivated to the best advantage, by drawing up a rough plan of the various plots and borders and selecting the vegetables to be grown upon each. Every detail as to cropping the ground need not be arranged on paper before the season begins, for such a proceeding would be impossible, as every practical man knows,

but a prepared scheme is needful. By having a plan of the kitchen garden, one can decide upon the principal crops to grow upon each plot before the planting time arrives. Knowing exactly how the land is at present occupied this will not be difficult. To a certain extent the cultivator has to be guided by his own circumstances after the principal outlines of cropping the garden have been decided upon. What a book can do, however, and what every book should do, is to lay down the principles upon which a man ought to work ; the man himself must of necessity fill in a certain amount of detail. As a guide therefore we will enumerate one or two of the first principles of successful kitchen gardening. The first and most important of these is the

Rotation of Crops.—It is folly to endeavour to cultivate the same crop year after year upon the same piece of ground ; a change is absolutely necessary and the reason is this. Each vegetable (or those closely allied), takes from the land certain elements of plant food in a larger proportion than another vegetable would do, therefore if one crop is grown upon the same land year after year the result must inevitably be that the latter loses a valuable constituent. By changing the order of the crops, which is exactly what is implied by “rotation of crops,” such a result is averted, for the next vegetable grown upon the land would absorb other plant food in quantity, thus allowing the soil to recover its lost vitality. By rotating the crops the soil is allowed every opportunity of replenishing the food the

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previous crop has diminished. This principle cannot always be freely practised. It is not absolutely essential, however, that various crops be grown upon different land every year, providing the land is well manured after gathering the vegetables; sometimes very probably it would be most inconvenient, or perhaps impossible, but the principle is to make a succession of changes. For instance, it is wrong to adopt the plan of growing Potatoes upon the same land year after year, yet it may happen that it is not possible to prevent this for say two consecutive years, and no harm would result. The same remarks apply also to members of the Cabbage family, that is to say all Brassicæ, which also should if possible be given different ground at every fresh planting. But as mentioned above heavy manuring will modify and render this practice less necessary. It is not in every garden, however, that manure can be had in large quantities, and gardeners in this predicament would do well to attend as strictly as possible to the proper rotation of crops. It is only in this way that the best results can be obtained by those with limited means of improving the land, and to such therefore the accompanying tables will be of some importance.

In the accompanying tables each plot has, for convenience sake and clearness, been divided into three parts. It will be noticed that throughout the five years Plot II. remains undisturbed. The vegetables planted on it will continue to give good results for many years, all of them for five years at least, and in fact are all

ROTATION OF CROPS

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Plor I.—Occupied for the most part by the frame ground, the remaining portion being devoted to Bush Fruit Trees.					
Plor II.—Permanent Crops, Horseradish, Asparagus, Rhubarb, Artichokes (Jerusalem and Globe). These may remain undisturbed for several years.					
Plor III.		Plor IV.	Plor V.	Plor VI.	
1st year.	Potatoes, Peas and Cauliflowers in succession.	Strawberries, Winter and Spring Broccoli and Autumn Cabbage, Celery, Roots.	Broad, French and Runner Beans, Onions, Leeks and Cabbage.	Seakale, Early and Late Savoy, Coleworts, Brussels Sprouts, Scotch Kale.	
2nd year.	Brussels Sprouts after Potatoes; Parsnips, Carrots and Beet after Cauliflowers.	Strawberries, Seakale after Roots, Onions after Celery, Coleworts and Autumn Cabbage after Onions.	Potatoes and Peas in succession, Celery and Kale after Onions, etc.	Cauliflowers in succession after Seakale, Turnips and Beans after Savoy, etc.	
3rd year.	Potatoes after Roots. Turnips and Beans of sorts after Brussels Sprouts.	Strawberries, Cauliflowers and Peas in succession after Seakale.	Brussels Sprouts after Potatoes, etc., Onions and Leeks after Celery, also Winter and Spring Broccoli.	Roots after Cauliflowers, Celery after late Greens, etc.	

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the better when left alone. To have such crops growing close together and upon the same plot of ground is obviously a great convenience.

With reference to the Strawberry, a plantation is here made to last for three years. Some growers destroy the plants after the second year, contending that the third year's crop of fruit does not pay, as it is poor. If this method is followed, a fresh plantation of Strawberry plants must be made every year. Upon light, hungry soil the Strawberry will not fruit well for more than two years, but upon good and properly tilled land the third year's crop is satisfactory. To provide an uninterrupted supply of fruits, a fresh planting would be necessary every two years (as shown in the tables), if the plants produce three crops of fruit. The cultivator will soon learn whether his land is sufficiently good to allow this to be done.

CHAPTER II.

POPULAR VEGETABLES.

ARTICHOKES.

THERE are three distinct Artichokes, the Globe, the Jerusalem, and the Chinese. The Globe is quite different from the others, and requires special consideration. It is not largely grown, and varies greatly in quality, the finest forms being those which produce large succulent heads. The plants are at times grown from seed, but it is unwise to rely upon seedlings, as they are usually of little value. It is better to propagate by suckers when a good strain has been secured. The Globe Artichoke also is not hardy in severe winters, the plant frequently dying even when well protected. But much depends upon the locality; the growth in some districts being stronger than in others. Whether hardy or otherwise, make a new plantation every three or four years, as the old stools exhaust the soil, and the heads dwindle in size as the plants age.

The Jerusalem Artichoke is tuberous, generally placed in any out of the way corner, and there remains for many years, but by giving a change of soil

and selecting the seed carefully much better tubers are obtained.

The Chinese Artichoke is an excellent vegetable, but the small size of the tubers is against a wide popularity.

Globe Artichoke.—Ample space is necessary for this Artichoke, a distance of four feet between the rows being none too much, and half that distance from plant to plant. The suckers should be placed three together, as a clump gives a better return. Trench the land deeply, manure heavily, and prepare some time in advance of planting. In heavy land it will be advisable to incorporate lighter material or burnt refuse with the soil; also to take care that the plot is well drained. April is a good month to plant, and in dry seasons give water freely with liquid manure and salt dressings in showery weather from June to September. Guano and salt form one of the best foods for older plants not recently manured; give protection in the late autumn, and after the old growths are cut away place some fine ashes over the roots, and pack dry bracken litter round the young growths, as these supply heads for the following May. In cold or wet soils detach a few suckers from the finest forms, and place in boxes or frames for the next spring planting. If seed is sown sow it under glass in pots or in rows in April, but it is a mistake to raise plants in this way. Globe Artichokes yield from May to September, and it is well to cut the heads and place them in water

when full grown, as, if left too long, they harden and lose flavour.

Jerusalem Artichoke.—This Artichoke will grow in any soil, but is most successful in a deep friable, well-manured loam and in an open situation. We enjoy it in winter as a change from potatoes, and since the Messrs. Sutton introduced the smoother white tuber, which has fewer eyes and is of better flavour than the older types, the Jerusalem Artichoke is regarded with greater favour. It is profitable for the reason that, though it needs considerable space, the crop is in proportion. Many object to this root when served in the same way as potatoes, but there is no need to do this ; there are quite a dozen methods of cooking, and few roots are better for soups and gravies. It should be remembered that once the plant is grown it will reappear from the smallest portion of root, and, doubtless, that is one reason why the plants are not given new quarters so often as they deserve. It is an easy matter, however, to free the soil of them if care is taken when digging. Always purchase or save good seed, not trusting anything that will not give shapely roots, and change the stock when disease is probable or the roots fail to crop well. February and March are the best seasons to plant. There must be a space of three feet between the rows, and twelve inches between the sets. More room may be given, if available, and planting may also be done much earlier. Cover the sets with six inches of soil, and leave the tubers in their growing quarters, digging

them up as required, or clamp them in the same way that potatoes are frequently treated ; they are best when not housed in a warm store, but kept as cool as possible.

The Chinese Artichoke (Stachys tuberifera).—Owing to the small size of the curiously crinkled tubers, this has not become so popular as it deserves ; it needs good land and a little more attention as to culture than the Jerusalem Artichoke. The tubers are small, white, with a clear skin, and produced freely ; overcrowding is a mistake. It does well in a light freely manured loam, with the sets in rows two feet apart, and six inches between the sets. The tubers are much finer when there is no lack of moisture. It is a good plan to mulch between the rows in dry years. The tubers are ready for use early in the autumn, and, though not suitable where quantities are needed, this little root makes a good vegetable for game and entrées.

ASPARAGUS.

This is not always grown well, although great strides have been made in its culture during the past quarter of a century. Indeed, the splendid produce exhibited occasionally at the Temple Shows of the Royal Horticultural Society from the Colchester district, and at other shows, proves that given good culture English-grown Asparagus is as good, if not better, than that imported from the Continent.

English Asparagus is of vastly better flavour and quality in every way. For many years our system of growing this vegetable was confined to one method, that of narrow beds, the seeds were sown like Mustard and Cress, and the seedlings grown so thickly that it was impossible for the plants to attain proper size through their crowded condition.

Soils and Situations.—There can be no question whatever that Asparagus relishes a rich sandy alluvial soil, and, although it has been grown successfully on ground different to this, the results have not been so satisfactory, when labour and material are taken into account. Any soil therefore that is at all stiff and retentive of moisture should have materials to lighten and improve it. Large masses of wet animal manure in this case would do but little good. Some of the large market growers near the Metropolis who grow this vegetable well use road-scrapings and Thames sand freely when making new beds or quarters, an appropriate term, as the plants are grown in long rows and given ample space. The beds should be freely exposed in every way, but, if possible, given protection from strong winds which are injurious when top growth is heavy ; as if the tops are twisted growth unfortunately stops. In private gardens time is gained if small beds can be made on sheltered borders, but only sufficient to bring forward a few early dishes, as the best crops will be secured from open quarters. Although the roots enjoy the soil advised they are impatient of drought. The best

growths we ever saw were from beds of a light porous soil, but they were irrigated weekly, indeed twice a week in dry weather, and wherever liquid manure can be utilised from May to September there can be no doubt of its excellent feeding properties for Asparagus. Beds are sometimes formed on north borders for late supplies, but, so far, with poor results. There is no need of beds for late supplies as "grass" may be cut well into the late summer if the roots are attended to in the way of moisture. This late cutting, however, is not advisable, as the plant must have sufficient time to make its growth for another season, and a supply can be had for six months, from Christmas to Midsummer, by forcing and the ordinary supply from the open ground, surely a sufficiently long season for one vegetable. When the natural soil is unsuitable preparation of the beds will take time. In the case of heavy soil take off the top spit of soil that had been worked previously, place it on one side, and then trench the ground or double dig, and if expense is no object a portion of the lower spit may be removed entirely, and a liberal quantity of lighter soil added, such as burnt garden refuse, road-scrappings, wood ashes, sand or sandy mud, and old leaf soil. When digging add plenty of decayed manure, working this in the top soil placed on one side for the surface with the materials added as the work proceeds. In poor lands trenching is important, and in heavy land the lightest soil, or soil that has been worked or pulverised by the weather, should be kept on the surface, so that in

trenching the poor soil is kept underneath. Light gravelly soil needs a different kind of treatment. In this case trenching, *i.e.*, turning up the poor inert gravel soil, would prove injurious. The better plan is to double dig and incorporate plenty of food in the soil that is on the upper portion, not low down, and, if possible, add to the surface soil some good loam.

Sowing and Planting.—Under this heading must be considered sowing, although many good cultivators prefer plants to seed, and planting, of course, means a considerable saving of time, while it is not everyone who can grow the seedlings for planting, but they are easily obtained from growers who make their sale a speciality. There is no difficulty about seed sowing; one point often overlooked is that the seed is sown much too thickly; the plants are not thinned sufficiently, and there is too little space for the roots later on, the result being that the produce is small, and no matter how much manure is applied, if they are much crowded it is impossible to get healthy growth. Good Asparagus has been grown with little labour and cost, but experienced cultivation is necessary if fine heads are required from beds that will last for years. Where the seed beds are to remain for only three years, it will suffice to dig the land deeply, manure and sow. The French market gardeners have the rows of plants several feet apart, sometimes as much as six feet, and crop the ground between with Salad. In many gardens space is limited, so that this width is impossible, but a fair distance would be to

have two-foot alleys, and three feet beds, to allow of two rows of plants. The drills should be drawn at nine inches from the edge on both sides, and at intervals of eighteen inches ; in the row place a few seeds and cover over with fine soil. There is therefore a space of eighteen inches between the rows, and this space will give good "grass". The bed, being narrow, is more easily cleaned, and there is no need to tread on it when cutting. April is the month to sow, but the precise date depends on the locality and weather. In the north it will be later than in the south. If larger beds are preferred, a five-foot space may be given, and three rows of plants, but there is really no need for beds at all, in fact in light soils sowing on the flat is advisable, with ample space between the rows to admit of cleansing and cutting. Grown thus the soil is not so likely to get dry in the summer months, and better material is secured. Make the beds by throwing out a few inches of the top soil from the two-foot alleys on the surface of the beds before the sowing or, if planted, the soil may be used to cover the roots. When the seedlings are a few inches high, thin out, leaving one strong plant at every station in the row, or two may be left not quite close together, removing the more weakly in a fortnight. The only point in doing this is that should these seedlings be very close together care must be taken not to injure them. The thinning is often overlooked, but it is a most important matter. One must be severe at the start, and thin even to

one plant rather than leave half a dozen fighting for existence.

Planting.—One-, two- or even three-year-old roots may be used. When they are the latter a little more care is required. There are several ways of planting. A simple one is to stretch a line at the distances named, and draw out a drill with a wide hoe, and then place the plants, spreading out the roots, and taking care that they are not doubled but spread out evenly, and covered over with, say, three or four inches of soil. Another plan is to cut a trench as if laying Box, and place the roots fan shaped. There must be no crowding. Another good way is to plant on the top of a ridge of good soil, and cover with soil from the alley, lightly treading over the roots upon each side of the ridge when the covering soil is in position. Plants are also placed on the surface of the bed, and then covered with good soil, but this is not advisable, as such plants have, as they attain age, a tendency to force themselves out of the soil, with the result that the crown gets dry and suffers. If three-year-old plants are used, set to work quickly, not allowing the roots to become dry. Two-year-old roots are preferable, but whatever is used lift carefully, damp over and plant as soon as possible, getting the ground ready in advance. Should dry weather follow planting give plenty of water, and in light soils, especially when the roots are planted late, newly planted beds are benefited by a mulch of short litter. Asparagus may be got

in much later even than April, but more care is necessary then and afterwards when the weather is hot or dry.

The after management consists in feeding and keeping clean. There should be no cutting of plants from seed until the third year, and only a little then. Much, however, depends upon the strength of the plant. Few things are benefited more than *Asparagus* by flooding the beds during growth with liquid manure and other foods, and excellent *Asparagus* foods may now be obtained, while salt and guano are valuable, the latter being given in showery weather from May to July, or salt and guano mixed are quite as beneficial. Such foods as nitrates and sulphates are also very stimulating. Salt should be given from May to September, not in winter. Another point about which much difference exists is the manuring of the beds in autumn. So much depends upon the soil, but the best cultivators dress with rotten manure in February, covering this with a few inches of top soil from the alley. This promotes a longer season of "grass" when cutting. Some growers think that by manuring much earlier the manure gets pulverised by the weather, but in light soils the extra covering in shape of a mulch is helpful, as the roots do not like drought at all.

Many beds are ruined through allowing the seed berries to fall in the autumn. The seed-bearing stems should be cut before the berries fall, otherwise seedlings spring up the following season and overcrowd the parent plants.



BRUSSELS SPROUT RIDGEWELLS CAMBRIDGE CHAMPION.



CABBAGE WYTCHES EARLY GEM.

Cutting should cease at midsummer, and weed growth must never be allowed, but salt dressings at the times advised will check this development. As the plants attain age, a surface dressing of rich soil and bone meal will be beneficial, and early in the spring to hasten growth place a few inches of light litter over the surface of the beds, removing it to the alleys in the daytime, as frost often occurs at that season of the year. The best varieties are : Connover's Colossal, the Argenteuil, Giant or Battersea, and Sutton's Giant.

Forcing.—Asparagus may be forced in various ways. When the roots are lifted they can be forced with little trouble in a warm house, the temperature of which does not exceed 60°, indeed 5° lower will suffice, as too much heat means a weakly growth. In many gardens there is no space to grow roots for forcing ; it must be remembered that once the roots are forced they are useless, also that at the least they take three years, sometimes more, to attain sufficient size for the purpose. There is, however, no difficulty in purchasing roots ready grown for forcing, and these will provide a supply until the beds are ready. To get forced Asparagus quickly bottom heat may be used ; but it is well to provide this sparingly, as without bottom heat, simply by starting the roots in a warm house, less than a month will suffice to produce the forced material. With lifted roots to keep up a regular supply, say, to begin cutting in the early part of December, about half a dozen batches of plants in

sufficient quantity must be used, but lifted roots are not so productive as older ones in permanent beds. Give rather more warmth for the December forcing, and a few days' longer forcing may be needed, but after that, if the batches are placed indoors every three weeks, there will be a full supply. For the early batch bottom heat such as leaves and litter may be used to force up the growth. Asparagus for later supplies may be grown in frames placed on a good bed of slow heating materials, covering the glass well at night to maintain an even temperature. The removal of roots to frames filled with fermenting material is a simple matter, and Asparagus grown thus, that is, near the glass, is better than that from hothouses. Market growers force old roots. Deep and wide trenches are dug out, fresh manure is placed in them, and then the roots. Frames are used, and manure is used freely outside them.

A much better system of forcing, however, is to use hot water. It is costly at the start, as the pipes, boiler, brickwork and labour must be taken into account, but it is money well spent when the cost of lifting roots for forcing, and manures, and labour are considered. When hot-water pipes are used, beds need more moisture, as they dry up quickly, both in summer and during the forcing period, so that in forming new beds an efficient water supply should be arranged for ; indeed, if the beds can be flooded so much the better. From May until the end of August the plants must make a liberal top growth, and without

this the crown growths will be poor for forcing next season. Permanent beds forced thus last many years, and, if they are forced annually, produce may be obtained early in the year, but, of course, the beds need much feeding after the cutting ceases. If, for instance, the beds are started in December and cutting begins in January or a month or six weeks from the time of starting, there will be a long supply, that is, in ordinary seasons, from the end of January until the beds in the open are ready, when cutting should cease, and the beds receive liberal supplies of food in the shape of quick-acting fertilisers and liquid manure. Apply these at least once a month until top growth is less active.

In forming beds heated by hot-water pipes, brick sides are best, and the chamber must be of sufficient depth for the heat to circulate freely. A flow and return pipe will be sufficient, and the glass frame or, what is better, sliding sashes should be placed over the beds, as then it is handier to get at the plants during growth. In any case the frames for covering the beds must be portable, as they are best removed when forcing ceases, but they are most valuable in the kitchen garden, as in the early spring they may be used for early vegetables just planted out or sown, such as French Beans, Cauliflowers, Salads, or for plants and fruits, and in the early autumn for late Beans and Salads. The temperature of the frame should not be high, sixty-five degrees being quite sufficient. During sunshine, and as the days lengthen,

use less fire heat and give more ventilation. The system of forcing practised at Syon House for many years, and with considerable success, is quite reliable and not costly. There is nothing elaborate in the process at the start, and once the beds are made they last for many years. The forcing beds at Syon are in an open position, and placed in a portion of the garden where the forcing of other vegetables is usually undertaken. The beds are about fifty feet long, and five feet broad, with three rows of plants about eighteen inches apart in the row, and with ample room at command two rows of plants would suffice, but excellent material is obtained even with the restricted space given. Wider beds are a mistake, and if hot water be not used a distance of four feet is preferable with two rows of plants, as with wide beds and only fermenting materials the warmth does not reach the centre of the bed, and it is more difficult to cut the stems. The beds are three feet deep, a good depth for forced beds. If shallower so much greater is the need for moisture. The alleys are also three feet deep and are formed thus: the two bottom courses are solid, but there is only one brick for the foundation; the second course is laid lengthwise, so that there is only a four and a half inch wall, and this is pigeon-holed throughout. It is unnecessary to describe the making of the beds, but remember that the soil must be good at the start. Much the same routine will be required as for permanent beds in the open, as regards sowing or planting. Use fresh leaves largely, and these can be

collected and placed in bulk as gathered, and as these materials are gathered by the latter part of December, and placed in large heaps, they have begun to heat, and are then well-trodden in the alleys. It is important that every layer of leaves should be well rammed into position. At the start a frequent practice at Syon is to wheel the leaves direct into the alleys, but when finishing off the beds secure the best material, such as oak or beech leaves. Wooden framework eighteen inches deep with cross bars is placed on the top of the walls, the latter are a little higher than the beds, and another lot of leaves and warm manure is placed so that the top of the framework is covered. On the surface of the beds is put a depth of from eighteen inches to two feet of warm litter and in wet or snowy weather covers are used to keep the material dry. Additions are made to the litter both on the beds and in the alleys ; a slight shrinkage is always occurring as the leaves become heated through. Doubtless, glass frames would be preferable to the framework and litter, but large quantities were necessary, six beds being cut from at a time. Wooden shutters were formerly used, but litter and dressed covers are better, and the litter is easily renewed or added to in cold weather. The old decayed heating material must be removed in November, and used in the garden for various crops. The beds will give a good cutting in six weeks from the date of placing the whole in readiness for forcing, but there must be a good depth of fine soil on the surface to allow the growths to

attain a fair height. Previous to placing the leaves in position, indeed early in November, rake over the beds, using a quick-acting fertiliser, which is conveyed to the roots by the rains just before growth begins. When cutting ceases, food should be freely given until midsummer. The beds will give a supply until the end of April, indeed later, but it is not advisable to cut after that date. A three months' supply is not bad, and the produce from beds forced thus is equal to that from beds in the open. There is one objection: the growths early in the season are white, but as the weather becomes warmer, the beds can be exposed in the middle of the day.

BEANS.

Beans are divided into three distinct groups, the French, Runner, and Broad, and we may add another type, which is closely related to the tall Runner—the Climbing French Bean, of which there are half a dozen different varieties, very free bearing, and available over a long season. Among our tender or summer vegetables the French Bean is a great favourite. Few vegetables force more freely, and in some parts of the country they are available every week of the year, while in most places there is no difficulty in having a nine or ten months' supply. The most troublesome period to bridge over, especially near large towns, is from November to the end of January, as the flowers fail to set properly, and the result is an unprofitable crop.

The Broad Bean needs less care ; it is hardy, very accommodating as to soil and position, and is in perfection in the early summer. It may be forced, at least it does well in pots at the start. The Runner is more tender than any ; if the seed is sown too early it is injured and the young plants are soon crippled by frost.

Dwarf Beans.—These are also known as French or Kidney Beans, and few vegetables are more profitable when well grown. They are not fastidious and prefer good though light soil. Those who have a heavy clay soil to deal with can easily make it lighter by incorporating with it such materials as burnt garden refuse, old mortar, leaf mould, road scrapings and wood ashes. Another satisfactory plan is to dig deeply, and manure freely ; in a holding soil the grower reaps some benefit in summer as, if the weather is dry, the crop lasts longer. For the first crop sown in the open there can be no better position than a warm, well-drained, south border. Earliness in most gardens is a great gain, but only grow a small quantity compared to the later sowings which require an open quarter. Both the French and Runner Beans (especially the first named) are sown much too thickly ; it is impossible for them to thrive under such conditions. There is some excuse for sowing the first lot thickly, as, owing to our peculiar climate, we cannot depend on the seed germinating, but it is an easy matter to thin out the seedlings once they are in vigorous growth. In many gardens an early crop may be secured by sowing under glass and

transferring the seedlings to a warm border. Few plants do better when not forced too much, that is, merely given glass protection for a short time. Some gardeners sow in a warm house, and as soon as the plants are well through the soil transfer them to cold frames.

Seed of Early Wonder sown in five-inch pots, say in the middle of March, and given cold-frame protection, will make strong plants for planting out a month later ; give shelter for a time. If hand glasses can be spared so much the better, as, though the shelter is not often required during the day, it is so at night for a time, as the plant makes slow progress in cold weather.

The first sowing in the open depends upon the soil, locality and seasons. In heavy wet soils one cannot sow so early as when the soil is light, but the staple can be improved with such light materials as previously advised. In the South seed may be sown in the second week in April, later in the Midlands, and at the end of the month in the North, at a distance of two feet apart between the rows for the medium growers, and more for the stronger ones. Sow seed every three weeks from the 1st of April till the early part of August, and there will be no break in the supply. It is better to sow small quantities as advised than to make one or two large sowings, as, unless the plant is well fed or watered, it fails to yield. The later sowing should be so timed that the plants require protection from frost.

Forcing.—This important garden practice may commence so that the forced plants are ready when the outdoor supply is over. It is a good plan to sow seed for the autumn supply in frames in August or early in September, and this batch will crop until December. It is a mistake to sow later, as the risk of failure is great, and is not worth the trouble and expense incurred. But there will be greater success if seed is sown in pots late in December or early in January. Use a small pot for this early supply, a six- or seven-inch size being quite large enough, and to ensure quick germination bottom heat is necessary. Place the pots with the seed in them on the warm pipes, and give no water to the soil until the seedlings are showing freely. Much the same method of culture is needed as for open ground crops, that is, a rich root run, seed to be sown every three weeks, and ample supplies of moisture when the plants are in full vigour. If small pots are used four to five plants will suffice, and thin the seedlings to this number. When the pots are eight inch, then six or seven plants will be the correct quantity. The larger pots are advisable for supplies after February, and at that date seed of some of the stronger growers may be grown, such as Magnum Bonum, Progress and the Canadian Wonder. Mr. Wythes writes: "For early forcing, some years ago, I made a trial of all early varieties, and also saw a very large trial in the Royal Horticultural Society's Garden. There the Early Favourite, Ne Plus Ultra and the Sutton Forcing

were excellent, and among the older varieties the Early Dun, Mohawk, Sion House and Osborne's Forcing." The French Bean when forced delights in warmth and moisture, not so much at the roots as in the atmosphere, and grown under these conditions there is no difficulty in having good pods in six weeks from the time of sowing the seed. A temperature of 65° to 70° by day is none too much, indeed, with ample supplies of moisture, the house with sun heat may be 80° to 90° at closing. Avoid cold draughts, and cold water soon checks growth, whilst dryness is answerable for red spider, and a check of any nature soon cripples growth. There are other ways of forcing better than pot culture, and one consists in growing the plants in low pits or houses, not far from the glass. The roots should be in a good, rich bed of soil, with a liberal amount of hot-water pipes running underneath, so that the bottom heat is never lower than 70° to 80°. Grown in this way the plant does splendidly, indeed, there is no difficulty in getting three crops from the same plant. As soon as one is gathered the plants are topped, dressed with a quick-acting fertiliser or decayed manure, and given a little more warmth to encourage new growth, and tepid liquid manure is supplied to the roots. The bed for plants grown thus should be from nine inches to twelve inches deep, and there should be perfect drainage; the seed may be sown in the bed or in three-inch pots, and the seedlings planted out firmly, care being taken to keep the roots from injury. Sowing in

small pots, as the plants are then raised more quickly, is the right plan for early forcing. For May and early June supplies a good number of seeds may be sown in small pots and then planted out in cold frames ; the seed is sown early in March, and the planting done a month later in rich soil ; the soil of an old Cucumber bed does well. Plants grown thus give welcome dishes before those in the open are ready.

Broad Beans.—The Broad Bean is not so great a favourite as the Dwarf French type, but much depends on the variety, the way it is cooked and other details not necessary to dwell upon. Those who object to the peculiar flavour of this vegetable should try it cooked in a much younger state, and another way to get rid of the harsh flavour of older Beans is to remove the skins before they are cooked. This can be done when the pods are shelled. The Green Windsor variety is the best flavoured of this section, but, unfortunately is not the earliest, the small, hardy Mazagan being in season before any others, even the Early Longpod, but the last mentioned is the more productive. There are several enormous podding varieties, such as the Mammoth, and Carter's Leviathan, but it is unwise to grow them in such quantities as the Green Windsor ; they are valuable for exhibition, and their flavour is first rate, but the crops are not large. Broad Beans are so easily grown that very few cultural details are required. They like a strong loamy soil, though they will grow in a lighter one, but in this they are more

subject to the attacks of green and black fly ; the latter pest is troublesome to get rid of in dry seasons and prevents the flowers setting. For an early crop sow in pots or boxes under glass in January, and plant out early in March. Pots, doubtless, are preferable, as the roots are less disturbed at the planting out, but with care they lift well out of boxes if the seed is not sown too thickly. Use turfy loam and press the soil firmly when the seeds are sown. Plants raised thus will be quite two to three weeks earlier than the first lot in the open ground ; they are very dwarf, flower close to the soil, and if planted on a warm border, two feet apart between the rows, give a good return. Seed may be sown in the open ground any time in February according to the weather and locality, in rows three feet apart in well-enriched soil, using the Longpod section for the first crop, another sowing being made three weeks or a month later of the larger-podding varieties on an open border. Later sowings should be made in April and May, but these should be of the Green Windsor type, and the site for them must be cool when the garden soil is porous or gravelly, indeed, for late supplies east or north borders are preferable. Stop the plants early to secure the first flowers that open at the base, and give the plants moisture freely in dry seasons. It is a good plan, in order to get a very late supply, to sow the small Beck's Dwarf Gem or Cluster Bean in shaded ground in May. It is a reliable variety, very small, and may be grown thicker than the others

named. The same remarks apply to the Mazagan. This sown late will not need more than a two-foot space between the rows. The old way of sowing Broad Beans in October or November is less practised than formerly, and for the good reason that losses are great, and plants often fall a prey to birds and vermin, but there can be no question whatever that plants grown thus are much earlier and dwarfer than those sown in February. Less space is needed and they can be protected more readily. Such varieties as the Early Mazagan, Early Longpod, and Beck's Dwarf are the best, and the land should be well prepared, using wood ashes, soot or lime freely when digging the soil to destroy slugs or snails. It is also wise when the plants are well above the soil to draw the earth close to them as a protection against cold winds.

Runner Beans.—These have a shorter season than other beans and it is not safe to sow till May, and even then in cold exposed gardens the middle of the month is early enough. The plants start badly when the seeds are slow in germinating, and an early lot, if desired, may be secured by sowing under glass, as advised for the Broad section, and planting out the latter part of May. There are several splendid varieties to select from, but this type will probably be less grown now the newer form of Dwarf Beans has found so much favour. The ordinary Runner Bean needs much room, as though the plants at the start benefit by timely shelter, later they need free exposure, a rich root run, and plenty of moisture in dry seasons ; indeed, it will

be found that very heavy rain is needed before these plants benefit, as their abundant top growth throws the moisture away from the roots. The best way in private gardens is to grow this plant in trenches such as are prepared for celery. The trenches give timely protection to the growing plants, and water given during summer is retained better than if the sowing had been made on the level. With regard to the distances, be liberal. It is much better to give a wider space than is often advised, and to grow such crops as Cauliflowers between, or other green vegetables that are cleared at the same time as the Beans. If the land is available, at least five to six feet should be given the plants between the rows. If less room is essential, take out the points or tops of the plants when four feet growth has been made. The Runner is grown in market gardens much closer than this, often only two feet between the plants, and topped at two feet. No stakes are provided. It may be asked what advantage is there in growing Runners thus when Dwarf Beans would not require stopping. The answer is that the Runners crop longer, root more deeply, and are not so quickly affected by drought, and another point is that the pods, being larger, are heavier, and more easily gathered. A second sowing may be made in June for a late supply, as these will supply better pods in greater quantities. Carter's Scarlet Emperor and Sutton's Prizewinner are two grand sorts.

Climbing French Beans.—These are much earlier than the older Runner, more shapely, and very pro-

ductive. Sutton's Earliest of All is a splendid type ; the pods are very fleshy, succulent, and less stringy than the ordinary Runner, and the pods are delicious if gathered when four or five inches long, and cooked whole. Other fine varieties are the Excelsior, Epicure and Tender and True, the last-named being a great cropper and very profitable for market. It is not unlike the well-known Dwarf Canadian Wonder in shape, and may be sown instead of that variety. It runs about six feet high, and the plant is very robust. Excelsior is a taller Bean, reaching eight to ten feet in height, and the handsome pods are produced in clusters. Epicure should be grown in all gardens where quality is considered. Few are better in this respect, and it is early. Grow the Climbing Runner Beans in the same way as the Runner, except that the plants need short stakes, and may be sown earlier. One variety that should find space on account of its excellence is Veitch's Climbing ; it greatly resembles Tender and True, is of delicious flavour, and a great cropper. It was given a first class certificate by the Royal Horticultural Society when it was introduced by a noted grower of vegetables. These plants thrive under the same conditions as the older type, and are enormous croppers when given a rich root run, and ample supplies of moisture.

BEETROOT.

This is a root vegetable of great value as an article of food, because, in addition to its ordinary

properties, it contains sugar in considerable proportions. Although it is seldom used as an ordinary vegetable, it is a salad of remarkable excellence when properly cooked, peeled and sliced. Whether used with mixed salads, or eaten without ingredients it is wholesome and delicious. If the nutritious properties of Beetroot were more fully understood the roots would be regarded as a staple article of food. There are two forms of Beet, the Round or the Globular, which forms on the surface of the ground in the process of growth, and the Long- or Tapering-rooted, which buries itself in the soil. The Round-rooted varieties are known as the Egyptian Turnip-rooted, and the Globe-shaped or Crimson Globe. The roots of the latter have a very dark and refined flesh, and are much better altogether than those of the Egyptian; indeed, we need only consider the Globular form. The great merit of this variety is that it bulbs early in summer, and if seed be sown in March or early in April in good soil, and the young plants thinned to six inches apart in rows good fleshy roots are available for use by the middle of July. They become full grown a month later. Where there is a large demand for early Beets for saladings, or where good roots are required for exhibition at Summer Shows, Sutton's Globe satisfies all requirements.

Tap-rooted Beets are represented by many varieties. The best time to make sowings is during April and May, but as a rule May is sufficiently

early. No one needs large roots, but rather those of medium size, smooth and handsome.

Good red flesh varieties, the colour showing when the flesh is cut into, are Blood-red, Dell's Crimson, Pragnell's Exhibition and Nutting's Dwarf-red ; varieties with a very dark, almost black, flesh are Cheltenham Green Top and Sutton's Black. All these varieties need similar culture. To have good clean roots, trench the ground twenty inches deep in winter, burying some half-decayed manure low down. If by the spring the soil seems to have hardened fork it well over, and sow the seed at the times previously mentioned. Draw drills two inches deep, twelve inches apart, and sow the seeds thinly along the drills, then cover them up. When the seedlings are three inches high thin them out to six inches apart in the rows, and use the hoe frequently to stir the soil and keep down weeds. The plants need little further attention. If the ground has been manured for a previous crop so much the better ; it is not wise to apply fresh manure near the surface of the ground.

THE BRASSICAS.

We may group under this heading some of the most important of green vegetables such as the Borecoles or Kales, the Broccoli, Cauliflower and the Cabbage, a large family indeed, and one that the grower must cultivate largely to maintain a constant supply. It is impossible to consider all these groups under one head-

ing as far as cultural advice is concerned, for the Cauliflower is quite distinct from the Kales, the former belonging to the summer and the latter to the winter. Like many other vegetables during the past quarter of a century the Brassicas have been added to by many new and improved varieties, especially the Broccoli section. Although a quite hardy variety has yet to be raised, the hybridist has obtained several of dwarfer growth than the older forms, and these pass the winter better than the large coarse kinds so much in favour. The Kales, as is well known, are the least particular of the whole race, as they are happy in almost all soils, and remarkably hardy ; they are great favourites in Scotland, where they are usually spoken of as "Scotch " Kales.

The Cabbage again years ago was represented by none too early varieties, and "bolting" or running to seed was quite a usual condition. This is not the case in the present day. Several excellent early Cabbages are available of reasonable size.

BORECOLES.

There are many forms in this section, and the most useful is the Scotch or Green Curled. Several splendid hardy varieties have been raised, and a recent introduction, the Arctic Curled, is most valuable, the Arctic Green and Purple in particular being delicious green vegetables. With regard to soils, the Kales are not particular, but we notice that the more deeply cultivated



CAULIFLOWER KING OF CAULIFLOWERS.



HOUSE OF CUCUMBER SATISFACTION.

the ground, so much finer are the heads produced. Their season is from October until May, and there should be two sowings, one for an autumn supply, and the other for a late winter, as if the seed is sown too early, the plant is inclined to run to seed when kept to meet a late supply. When a sowing is made in March, and again after an interval of six weeks, there will be a good early and late supply, but much depends upon the seed bed. Much vigour is lost through overcrowding ; indeed, it is far better to sow late than too early and let the plants remain so long in a crowded bed that they fight for supremacy, until it becomes a question of the survival of the fittest. When seedlings "brought up" in this way are planted, several weeks elapse before the roots take hold of the soil. In cold late districts the Kales are sometimes treated like Spring Cabbage, that is, sown in the late summer, and planted out in October or November. A large plant is obtained in this way, but it runs to seed quickly next season, so that it is far better to sow early in March and plant out in drills when ready. As the land is frequently occupied, and the seedlings cannot be planted for a time, it is a good plan to prick them out in lines, and then lift them carefully later on into their permanent quarters. A fair distance for most of the Kales is two feet between the rows, and eighteen inches to two feet in the row, according to the variety, the larger types requiring, of course, more space. Plant in showery weather if possible, and the remarks made as to pricking out the

seedlings from the seed beds apply with equal force to the other groups of this family, such as Brussels Sprouts. Kales are best in an open quarter, where fresh manures have not been given too heavily ; they follow deep rooting crops well, such as Potatoes or Celery. In light land it is wise to plant Kales after Strawberries that have only been two years on the land. Merely draw clean drills for the Kales, and then plant, as one object is to secure a short sturdy growth, not one that is soft and sappy. The latest Kales are the large-leafed Cottagers, and the Asparagus, the shoots of which are used. Reed's Hearting is a late Scotch Curled, and a very fine type. Reference has been made already to the Arctic Kales, and also for early supplies the Dwarf Green Curled, the Sprouting Kales, and Carter's Drumhead are all excellent forms.

The variegated forms, although pretty, cannot be recommended for the garden, owing to their want of hardiness, in fact, save for their decorative value they are useless.

BRUSSELS SPROUTS.

This well-known vegetable needs a longer season of growth than the Borecole. When the seed is sown early and other matters are carefully attended to a splendid yield is the result. The large, coarse, loose Sprout, not unlike a small Savoy cabbage, is useless, and should never be encouraged. It is the

medium or small bullet-like Sprout that is produced so freely and possesses such a delicate flavour. There is no loss in growing these varieties, as, though the plant is smaller, a greater quantity can be grown in the same space than of the larger varieties. Sow the seed in frames or boxes in January, and prick the seedlings off about six inches apart and early in May lift them with a trowel and place in their permanent quarters, a yard apart between the rows and two feet from plant to plant, indeed some growers plant them a yard apart each way. It is wise to prepare a piece of land specially for this vegetable, and so draw the drills that it is easier to water the plants at the start. This is a great gain in dry soils, but as the rows are three feet apart the land must not be empty so long, so that in February plant such crops as Spinach, Lettuce or anything else that is cleared off before the crop encroaches on the Brussels Sprouts, but, of course, this smaller catch crop is between the rows. One row will suffice ; the crop of Spinach should be sown early and not allowed to remain after June.

The ordinary method of culture is to sow as early as possible in March on a warm border, and plant out when the seedlings are large enough ; indeed, the earlier they are planted the better, as, when a hot dry summer follows, the progress made is disappointing. It is also a wise plan to make a later sowing in April, but so sow the seed that there is ample room for the seedlings. From this sowing the latest supplies are secured. As the plants are dwarf the Sprouts re-

main sound until late in spring, and this batch usually follows early Potatoes, such as the Ashleaf.

The same remarks concerning seed sowing in the autumn recommended for Kales apply to Brussels Sprouts.

Brussels Sprouts should not occupy the same land for several seasons, as they need plenty of food, and the soil gets "sick"; indeed, in the case of all the Cabbage tribe a change of soil should always be given, if possible, otherwise the roots club badly.

When it is seen that the soil promotes clubbing, give a change of crop, and dress the land with lime, soot and wood ashes or charred refuse, also dress with gas lime in the early autumn months, that is, some time in advance of planting. Turn the land up roughly, and then fork it over in the early spring to allow the weather to sweeten and pulverise it. There are several splendid varieties for early supplies; the Paragon is a very fine type for late use, while Matchless and Ridgewell's Cambridge Champion are specially good for the garden varieties. The latter is one of the best keeping, and of compact growth.

THE CABBAGE.

The Cabbage is, we think, after the Potato the most important vegetable in the garden, and more relished in early spring than at any other season. It is a matter for regret, however, that more attention is not paid to the autumn and winter varieties, such

as Christmas Drumhead, St. John's Day, and the new St. Martin. Cabbages may be grown in private gardens all the year round, as in the late autumn we have the Gem and Favourite types, delicious little Cabbages, and a few weeks earlier than these the useful Colewort is in season.

For a first supply sowings should be made from the middle to the end of July according to the locality, and give ample room in the seed bed. Some gardeners usually make two sowings, one the second week in July, and one in the last week, and if the first sowing proves too large, the loss is not great, as the plants come in useful for greens. A large planting is not usually made from the early sowing, but a full one from the second, selecting an open position, and well-cultivated soil. In many gardens no manure is given, but the land is simply dug for the early crop, that previously used for Onions being chosen. The soil for the Cabbage is then of the right character. Drills are drawn eighteen inches apart, and the plants made firm, this preparation ensuring a sturdy growth that does not suffer in severe weather. If the plants are placed in drills, it is an easy matter as the winter advances to mould them up to protect the stem, which is most influenced by frost. Young Cabbage plants are certainly not so successful in loose, recently manured land as in that made reasonably firm. They must absorb the food before winter sets in, when growth is almost at a standstill. The best time to feed is early in the season, when growth begins, and

then the crop can take advantage of the nitrates and other quick-acting fertilisers applied. Have a second lot of plants to follow the first, that is, if a portion of land is planted in February there should be a succession. Do not leave the plants in the seed beds all the winter, as, of course, severe losses occur, but at the time of planting in the autumn for first spring cutting prick out the seedlings in a well-drained soil six inches apart, and then form each row as the work proceeds. Place them well down in the soil where they will pass the winter safely, and make capital material for planting in February.

For the summer crop sow the seed early in the year, either in frames or in the open. If under glass the crop catches up the early spring supply, as those planted out in March soon turn in.

Owing to various causes there may be at times a dearth of autumn-sown plants, and to avoid this sow a little seed of an early variety in boxes or pans under glass. Sown early in January such varieties as Earliest or Early April will be ready in May if the seedlings are pricked out in boxes or frames, planted out in rich soil and well attended to.

Summer Cabbages will not need much space, but where green vegetables are required in plenty this crop is valuable, whilst it is easily produced. Sow the seed in the open in April and give ample room in seed beds to allow ready lifting of the plants, and a supply will result from July to September. Such varieties as Matchless, Gem, Favourite, Little Pixie, Tender

and True, and Beaconsfield are excellent for the summer, the last two being the largest, but these are all garden varieties, that is, of a compact growth.

Autumn Cabbages.—These may be placed in the front rank for the reason that in summer, with its wealth of choice vegetables, there is not so great a demand for Cabbages, but in the autumn this crop is welcome. The Coleworts, of course, form an important part of the autumn supply, and seed should be sown in May and July, the earlier date for supplies in late September and through October, and July for the later crop. These small Cabbages, of which the Rosette and Hardy Green are types, are of good quality; the Rosette is of compact growth, but less hardy than the other. They make a quick growth, and as this is developed in late summer a rich root run should be given with ample moisture. Little Pixie, Favourite and Little Gem are sown sometimes for November supplies, and though small they are most valuable, withstanding extremes of cold and wet weather better than the Rosette form.

Winter Cabbages.—This crop brings up the supply until a Spring Cabbage is ready. Winter Cabbages are distinguished by their firm and compact growth, short leg or stem, and good flavour. Christmas Drumhead, the St. John's Day and St. Martin are all trustworthy winter varieties, and keep sound for weeks after full growth has been reached; they are not large but of splendid quality. The variety St. Martin was raised by Mr. G. Wythes, in the Syon

House Gardens, Middlesex, the parents being the Rosette Colewort and Christmas Drumhead. Those sown in May and June, according to the locality, will keep up the supply to the date mentioned. They should be planted in an open, exposed border and in a good soil, and, like the Colewort, little space is necessary, eighteen inches between the rows being ample.

Savoy Cabbage.—Savoys are best when grown for a late autumn or mid-winter supply, and one of their virtues is their hardiness, as when not sown too early they stand the winter splendidly. If an early supply is desired seed sown in March will give produce in August, but rarely are Savoys wanted at this date as so many other vegetables are then in season. A small variety is preferable for a first supply, such as the Early Ulm and Earliest of All. These make a very compact growth and may be always planted a foot apart. There are some good varieties for a mid-season supply: the Perfection, Golden Globe and Reliance being quite safe in all ways. Great value should be placed upon the late sowings to provide the table from November until spring, and from seed sown in May heads will be obtained into the spring, selecting for this sowing Reliance, a small Savoy, New Year, a variety of medium growth, and the well-known Drumhead. The last mentioned needs more space than the others, two feet between the rows and eighteen inches in the rows being the correct distance to plant. The New Year also needs more space than the earlier ones and should be sown in April for

early winter supplies. The plants may with advantage follow early Potatoes, Spinach, or similar crops, and require a good root run.

BROCCOLI.

This is a popular vegetable, and can be obtained for about nine months of the year if the early autumn varieties are grown, and the latest such as Queen and Model. Unfortunately, the mid-winter and late Broccoli are none too hardy, being quickly affected by frost or north-east winds. Several valuable additions have been made of late years, and, though in many parts of the country, success is not so pronounced as in Cornwall, owing to the mild climate, this useful vegetable deserves to be grown well over a long season. Broccoli must always receive a change of quarters, no matter what variety is grown, as soil soon tires of this vegetable. The late varieties are sometimes planted after early Peas, Beans and Potatoes, and excellent returns of late Queen can be secured on land that has previously borne a single crop of Strawberries. When Strawberries are grown as annuals the soil is in good condition for late Broccoli at the end of June, but the plants must be robust, not thin and weakly seedlings. Much depends upon the soil, date of planting and variety, as to the distance to plant. Avoid rank manures which encourage a soft sappy growth that soon succumbs to frost. For the early Broccoli more food may be given, treating the plants

more like the Cauliflowers, which need liberal supplies of food.

Autumn Broccoli.—This type of Broccoli is very popular, but not so good in flavour as the spring and late varieties. It is unwise to get huge autumn produce for a private garden. The Autumn or Self-protecting are very valuable, and from seed sown late in February or March, good heads result in September. Make the March sowing on good land, and plant out in May or early June, in rows two feet apart, with eighteen inches between the plants. Six inches more room will be better each way on good land. The same distance will suffice for Michaelmas White, a superb variety of recent introduction, of good "protecting qualities," and coming true to season. When sown at the above dates the produce will be ready at Michaelmas. The older Walcheren should not be forgotten. Sown in March and May a succession will be provided to Christmas.

Winter Broccoli.—There are many varieties of spring Broccoli, and all are uncertain at times, but this is readily explained. During the autumn of 1901, for instance, the plants were making splendid growth, but very early in the season from fifteen to twenty degrees of frost occurred, which arrested it. The early autumn varieties suffered less severely than the early winter ones. Late planted Broccoli do not make in some seasons much progress at the start owing to heat and drought, with the result that at the end of the summer growth becomes very luxu-

riant under the influence of cooler nights and greater moisture ; the plants are tenderer and more susceptible to frost. The hardy varieties should be selected, not so much for mere size as for their compact growth, and the way they keep. Some gardeners would say that it is an easy matter to lift plants that have heads of any size, and store ; but it is useless to lift those only just forming. Christmas White, Vanguard, Early White and Penzance are excellent winter Broccoli, and mature in the order named. Snow's Winter White is one of the best when the seed can be obtained true. All the winter and spring Broccoli should be grown on an open, exposed site, without coddling, as the growth cannot be too hardy. It is not unusual to find that almost the entire winter crop has been killed in sheltered gardens, whereas in open fields losses are less severe, the plants are hardier and resist extremes of weather. The plants like a good loamy soil, or what is called a holding soil, as fewer losses occur if the plants are not too small. A long growing season is not desirable. Much depends upon the planting. Firmness is essential, and early planting saves much watering. It is a wise plan to plant quite small seedlings in their permanent quarters, an easy thing to do in drills, as though a few plants may die the blanks can be soon made good. Much time is thus saved, as once the plant has a fair root hold it grows freely. The longer the seedlings of any of the Brassicas remain in the seed beds the more likely are they to get drawn and badly "clubbed".

Spring Broccoli.—Many of the remarks concerning the earlier and mid-season Broccoli apply to the spring crop, but the varieties must be considered. Aim at getting variety. Some of the splendid late varieties are called Early Summer Broccoli, and in late seasons they are most valuable. The Universal Protecting Broccoli is considered by many gardeners even later than the well-known Late Queen. It is not of unduly strong growth, and the stock is very true from seed. It is advisable to sow the late varieties either towards the end of April or early in May. Ensure a good seed bed, and plant early. For earlier cutting in April and May, the Model and Late Queen will provide a supply, and add to these Champion, Late White Bouquet (more like a spring Cauliflower, a delicious flavour), and Carter's Eclipse (an old and trustworthy variety). Several others might be included in this list, but variety is not everything. The plants require proper attention at the start, and in winter and early spring protect the head, which may be done by tying the outer leaves over it.

THE CAULIFLOWER.

This vegetable is at its best during the summer months, namely from May till October, but the most delicately flavoured heads are generally produced in May and June. The Cauliflower matures more quickly than the Broccoli, and therefore requires considerable "feeding". The old system of getting



A PROFITABLE MUSHROOM HOUSE.



THE COMMON MUSHROOM.

an early supply by sowing in the autumn has much to recommend it if the plants can be housed under glass, but severe winters are fatal in many parts of the kingdom. Several years ago Cauliflowers were grown well in turf pits about three feet deep made in the autumn with walls of freshly cut turf. They were covered in severe weather with thatched hurdles. As glass erections are now common, Cauliflowers are often placed in cold frames and planted out in March. Another way is to pot up in small pots in October, and winter under glass and plant out. In sheltered gardens those placed under south walls or given hand-glass protection are valuable, where they pass through the winter satisfactorily. Cauliflowers were also planted under good-sized hand-glasses in October, from nine to twelve under each, and early in the spring all were lifted except the four corner ones over which the glass still remained. Those lifted were planted for a succession on a south border and in rich soil. The seed is usually sown in August or September, and in dry seasons the bed must be well watered to assist germination.

With the introduction, however, of such first crop varieties as Forerunner and Early Forcing, it is not so necessary to sow in autumn, as seed of these varieties sown in heat in January, and the seedlings pricked out in boxes or in a warm frame will provide excellent heads by the end of May. Of course, the plants raised in heat will need more protection when planted out, but harden them well previously by giv-

ing plenty of air. Plant in very rich soil. Seed of the small Early Snowball may be sown in February in frames, and good heads cut in thirteen weeks from the date of sowing, but a rich root run is essential. Other early kinds, such as the Older Early London, Early Walcheren and Defiance Forcing, are all useful for open-air sowing at the season named.

Summer Cauliflowers.—There is an excellent choice of summer varieties. When the Walcheren is sown in March, April and May, a succession is provided. The Esprit Mammoth, the Pearl, Purity, King of Cauliflowers and Magnum Bonum are all excellent. The summer plants can frequently occupy spaces between tall growing crops such as Runner Beans and Peas, and when grown in this way they can be cleared away in autumn. Summer Cauliflowers give little trouble. The seed is sown in the open, and the seedlings planted out in May, June and July; they will crop well into the early autumn, when the true autumn varieties become plentiful. Remember that Cauliflowers delight in much moisture, plenty of manure and ample supplies of liquid manure, with a mulch of decayed manure in summer when the soil is very light. The plants must always be two feet apart.

Autumn Cauliflowers.—This section contains some of the largest of all the varieties. The well-known Autumn Giant, Autumn Mammoth and Esprit Mammoth are all excellent for giving supplies from September to November. This sowing usually takes place in March or April. Six months' growth is

necessary in the case of the large growers, such as King of Cauliflowers and Giant. The soil must be rich and ample space provided, two and a half feet apart being the correct distance to plant. Some growers sow even earlier than advised in cold frames, sometimes in autumn, and plant out early in April. As in the case of Broccoli, the Cauliflower should receive a change of soil; it enjoys a rich, loose medium, as it is a gross "feeder". In poor soils or in land frequently cropped with the Cabbage tribe, "clubbing" is general. In South Devon excellent results are gained by sowing the autumn varieties in the open in September, and grown thus, failure is not frequent in hot and dry summers. The flowers or heads should not get too old. When of medium size or quite small it is wise to cut them for private use. In the case of a late crop, pull up the plants and place them in a cool place; it is far better that this should be done than to allow them to open and thus lose quality.

CUCUMBERS.

There are few gardens of any size in which Cucumbers are not grown in the summer season. Frequently the best means are not at command for the production of late fruits, but they can be purchased in mid-winter for as many pence as they could shillings some forty or fifty years ago. This reminds one also of the great progress that has taken place both in culture and quality. The old

ridge or open-air Cucumber is grown much less than formerly, but, if used as pickle or vegetable, it is well worth more attention. Even this form of Cucumber is an improvement upon what it was years ago ; the fruits are now more shapely, and of better colour.

With regard to culture much depends upon when the fruits are desired and the length of the supply. If grown in a pit or house with bottom heat from hot-water pipes, then their cultivation is easier.

Early Crops.—To get an early crop under glass seed should be sown in small pots early in the year ; many good growers sow in December or even earlier for the first crop, but unless a strong plant is secured there is no gain, but rather loss, as by sowing too early a weak plant results. It is better to sow so that when the seedlings have made three or four leaves they can be planted out in a warm bed. The warmth will soon promote root formation up the stem, and with frequent top dressings the growth will be strengthened. At the time of sowing the bed or soil should be ready, as the soil must be warm. If any delay should occur in making up the bed or planting the seedlings, shift the plants into larger pots, using a good light but rich compost, previously warmed through. Then plunge the plants in a warm bed to induce new root action. When placing the soil in the beds use a good turfy, light loam, enriched with cow manure or thoroughly decayed horse manure, and, if possible, a small quantity of wood ashes.

Much depends upon the grower as to the quantity of soil to use at the start. When ample top dressing can be given, as in large market gardens, larger quantities of soil are given at the start, with only top dressing or rich manure afterwards, but the market grower soon exhausts the plants, cutting a larger quantity of fruit at one time. A bushel of soil is ample to begin with, and as soon as the surface roots are running freely, add more, this being given every fortnight or three weeks, and as the plants come into bearing, such aids as bone-meal, or an approved quick-acting fertiliser are mixed with the soil. When planting, allow at least a yard between the plants; overcrowding is not an advantage. When liberal treatment is given, and the seeds are sown, say, early in January, fruits should be cut early in March. There is no difficulty whatever in having fruits in six weeks from the time of sowing, that is, if sown a little later on. Plants from seed sown in March, and grown in a liberal temperature, should fruit in six weeks, but there must be no check. Provide a rich root run and warm moist atmosphere.

When started allow the growth to reach the roof without any stopping back, unless there is an abundance of side or lateral growths, when the point of the leader may be taken out, and the shoots trained right and left. It is needful to fertilise the flowers early in the year, and when this is done to stop the overhead dampings for a time.

The house must never get dry, except when

the first fruits are showing, not later, as with increased sunlight and greater strength the flowers set freely, indeed too much so. Many plants are ruined through overcropping. The Cucumber plant will in fine weather require much root moisture, and the water must always be of the same temperature as the house. Give food freely also.

With regard to overhead syringing, be cautious at first, as then the plant is weak. A fine spraying twice a day will then suffice, but with increased strength more water may be given in every way. Keep the house quite moist, especially the bed near the hot-water pipes. To sum up, heat and moisture are essential in Cucumber culture.

Temperature and Shade.—Temperature plays an important part, also ventilation and shade, but the most successful growers rarely ventilate their Cucumber houses, but shade and keep them as moist as possible, when the fruiting stage is quickly reached. Cucumbers delight in a high temperature and moisture, and under these conditions insect pests are less troublesome and new growths abundant when the roots are constantly fed and the plant is not overcropped at one time. The day temperature may range from 65° to 80° according to the season ; thus, in January 65° to 70° would suffice with less moisture, while in May the maximum temperature would be more suitable, while the night temperature may range from 65° to 70° or 75° in warmer weather. The fires must not, however, be driven hard as dry hot pipes encourage green fly and

red spider ; the weather should be taken into account, and, if possible, in the case of early plants, say, those in growth from January to May, always cover the glass at night, as this saves hard stoking, and the atmosphere is kept moist and sweet.

In gardens where more ventilation is allowed and less shade, the steaming process is not followed, but the ventilators should be opened very sparingly until the plants are strong, and then avoid cold draughts ; shade as early as required. Always close the house before the sun leaves it, no matter if the thermometer runs up to 90° or 100°. If ample moisture is given in all parts of the house, so much the better.

The Training.—Plants need careful training. Gradually cut out the old fruiting wood, and train in new growths. This is important, and should be done weekly, removing old leafage not required, and laying in new wood, stopping shoots when necessary and removing badly shaped fruits, or those too thickly placed, to prevent that greatest of all evils, over-cropping.

Frame Plants.—These are not planted so early, but if the seed is sown in March or April the plants are a success. Much depends upon the frame, whether it is heated by hot-water pipes or only by manure. If by the latter, an April sowing will be sufficiently early. It is unnecessary to describe the way the plants should be raised, as the routine is the same as for house plants, except that in gardens where there are only frames Cucumbers are raised after the manure is warm. With pipes there is, of course, less trouble, and much the

same treatment is followed as in a house, except that the plants are on the bed. When there is no bottom heat start early, and with hot manure, which should be well rammed, and the heat allowed to rise freely before planting out. It is an excellent plan also to incorporate slow heating materials with the manure to prevent violent heat at the start, as this often cripples the strongest growth. Give the same kind of soil as previously advised. When this is placed in a heap in the centre of the light or sash, about nine inches from the glass, two plants may be planted, when a quick return is desired. If not, then use one plant, and stop the growth when about twelve inches long, and train the shoots top and bottom, using small pegs to keep them in position. When there are two treat in the same way, allowing half the space to each. Less moisture is needed for frame Cucumbers, and especially when manure is used to provide heat. One or two top dressings will suffice for frame plants, which must not be exposed to cold draughts, and give shade during the hottest part of the day, covering the glass at night when the plants are being started. Feed freely with liquid manure when the fruits are plentiful, and go over the plants weekly, lay in new growths, stop gross shoots, and cut out, where possible, old wood and leaves.

Winter Cucumbers.—These require similar culture to the earlier house plants, but the seed must be sown in August or September, and the seedlings grown on freely until November. They must not be allowed to fruit until then. A strong plant is



POTATO EARLY PURITAN.



FORCING RHUBARB WITH THE HELP OF AN OLD BARREL AND MANURE.

necessary by the time the days are shortening, otherwise there will be no fruit. The same temperatures will suffice, at least, the minimum one will be suitable, that is 70° by day or 65° in dull cold weather, and 60° to 65° at night, but allow the thermometer to rise freely by sun heat, and give tepid water when required. Cold water, or an excess and cold draughts at this time of the year will bring mildew. Give less soil at the roots, letting this be light and well-drained, and give top dressing when needed. Pot culture is excellent for winter plants, and this mode of culture is more suitable when the bottom heat is none too good, as by using sixteen- or eighteen-inch pots warm manures may be given to assist root growth. The pots may be placed on bricks over hot-water pipes with good results, and plants grown in this way make a short-jointed growth. When the pots are in the house in the autumn, they are only partially filled with soil, more being added as the growth progresses, but at all times it is well to make the soil in pots fairly firm. The following are excellent varieties at all seasons:—Sutton's Every Day, Satisfaction, Improved Telegraph, Matchless, Market Gem and Lockie's Perfection.

Outdoor Plants.—These are usually raised in frames or under hand-glasses. They are a success if treated in the same way as a vegetable marrow, and well repay a rich root run, and, if possible, a little fermenting material at the roots at the start, while a little timely protection may be given overhead after planting.

Cucumbers are quite a success in frames on a bed of some kind raised from the surface, and if the seeds are sown early in May, and the seedlings planted out in June, that will suffice. For pickling use only small fruits, and the plants may be grown close together. The market grower's plan is a good one, and consists in planting as advised for vegetable marrows, *i.e.*, about two and a half feet apart. King of the Ridge is one of the best varieties for the open air. In warm soils and localities a sowing can be made in the open beds the third week in May.

MUSHROOM GROWING IN GARDEN, FIELD AND COTTAGE PLOT.

Among the vegetables produced in garden or field the Mushroom is one of the most popular, and this popularity is not confined to one class. The difficulty is to obtain the article in a fresh condition and in sufficient quantities at a moderate price. This latter difficulty places the Mushroom entirely out of the reach of the masses of the people for certainly ten months out of the twelve, as except during September and October, when they are plentiful in some seasons in the fields, the price otherwise is prohibitive, being never less than 1s. per lb., and this not for fleshy, fresh British-grown Mushrooms, but for thin, dry and hard French ones, only fit for soups and flavourings. It must not be inferred from the above statement that there are no Mushrooms grown in England on commercial principles, as the

reverse is the fact, and so much are those fresh Mushrooms appreciated that they are immediately disposed of to regular customers at handsome prices in the local markets.

The Mushroom is a native of Britain, and can be grown here to a greater perfection than in any other part of the world, either out of doors in our fields, or under artificial conditions in houses specially prepared, or on the out-of-door system as practised by market garden growers.

With regard to the natural field crops in autumn after a hot summer, followed by warm and heavy showers of rain, on most of our warm and properly drained meadow lands, the valuable Mushroom comes up in generous quantities, and that without the help of man ; indeed, as a welcome gift from the lap of Nature, a gift of late years which has helped the farmer more on many occasions to pay the rent than have the ordinary cultivated crops of the farm. It is a moot question, but beyond the province of this work, as to whether field Mushrooms cannot be grown profitably ; it is well worth a trial, and is a hint to the Board of Agriculture and others interested. The cultivation of the Mushroom is dealt with from four different standpoints : (1) The professional or private gardener ; (2) the amateur ; (3) the market gardener ; and (4) the cottager, closing with a few hints as to successful methods of field culture, with a chapter of instructions how to manufacture Mushroom spawn.

In the homes of the rich there are for the most part the necessary materials for producing satisfactory crops in every season of the year, and managed as these gardens are by highly trained and experienced gardeners, it would seem superfluous to offer any remarks for their guidance on the growing of Mushrooms. Simple as it may seem to the inexperienced, the Mushroom is an erratic crop. The young horticultural student, earnestly endeavouring to qualify himself at some future time, not too remote, let us hope, for a responsible head gardener's position, will find a knowledge of Mushroom growing among the most useful of his acquisitions, as in good and well-equipped gardens Mushrooms are in urgent demand and expected almost every day in the year, and failure in the supply often makes matters very unpleasant for the gardener. Our first consideration must be the

Manure and its Preparation, the two fundamental principles on which success or failure rests. With regard to the most suitable material, horse manure is the best, and if good results are to be obtained the manure from corn-fed animals when little or no drugs are given should be chosen. Manure from heavily drugged horses is absolutely of no use for successful Mushroom growing, and this is one of the important points to notice. With regard to stables in private establishments this precaution is not so necessary, but where London or any other city's stable manure is the medium the grower cannot be too careful as to the quality of the manure he has to deal with.



SEA KALE FORCED IN BOX IN MUSHROOM HOUSE.



A TYPICAL TOMATO HOUSE WITH PLANTS IN AN EARLY STAGE OF GROWTH.

The Mushroom grower must be on good terms with the coachman or the man in charge of the stables, who will separate the manure of sick horses, and in this way prove a good friend. Some stables are provided with a covered roof over the manure yard, and, where this is the case, it will be sufficient if the stable manure is fetched away every three days, it must be taken away in the rough, long and short together. Where this provision does not exist it will be better to fetch the manure away every day, or at least every other day, and place it in a dry, open shed in the garden, as on keeping rain away from the manure depends much of the ultimate success of the crops. Whether it is decided to clear away the manure daily, every other day, or twice a week, let it be delivered, if possible, into a dry, open shed, where there is a free circulation of air, or minus an open shed, in some sheltered, dry and airy corner of the garden, where it can be protected and turned over, and the extra moisture liberated until it is dry enough to place in a heap to undergo slight fermentation. The first thing to do with the long and short manure from the stables is to turn it over with a three- or four-tined fork. A fork of this width will admit of all the actual manure falling through by slightly shaking it, as well as much of the short, littery straw. This is all we want from the manure for the purpose of making Mushroom beds, the long straw being laid on one side for other purposes, when it will be most useful, especially when the market garden aspect of Mushroom culture is dealt

with. The next process after the manure is properly shaken out from the rough straw is to lay it out on the floor of the shed at an even thickness of about seven inches in order to expose it to the air for the purpose of drying, and also to cause a very slow and almost imperceptible fermentation. Every load delivered must be served in the same way, and the whole turned over with the fork about every three or four days in order to liberate rank gases. After undergoing this process for about ten days or a fortnight the manure will be fit to throw together into a large heap to cause further fermentation, thereby reducing the heat of the manure to the temperature of 80° or 82° Fahr., when it will be of a safe and proper temperature to form into beds in the Mushroom house proper or wherever else it may be proposed to construct the beds.

Upon the careful preparation and the proper condition the manure may be in at the time the beds are made up depends to a larger extent than on any other particulars the success or otherwise of the crops. It is a well-known fact that Mushrooms abound in nitrogen. It is also well known that nitrogen is found in considerable quantities in the manure of horses, therefore in subjecting the manure to fermentation there is danger if this process is overdone of the nitrogen escaping in the way of ammonia to the great detriment of the manure and the subsequent crops. The chief lesson to be learnt from this is to be careful to prevent at all costs too rapid a fermentation and the consequent

high temperature. By adding, say, two barrowloads of soil to the cartload of manure and mixing well before the manure is formed into a heap for the purpose of fermentation, this mould will answer the useful purpose of absorbing the nitrogen, preventing its escape, and preserving it for the Mushrooms later on. The manure after being placed in a heap as advised should remain so for, say, three or four days. If not overdry when put up three days is quite long enough, but if moderately dry four days is not too long. The safest and best plan is to put a trial stick in the heap, one long enough to reach to the centre, say, three feet deep. It should be examined on the second and every subsequent day, and if the stick becomes in any way too hot for the hand to bear the heap must be opened out at once and the manure spread out for a few hours to cool, and afterwards put up again in the same way, and the same precautions taken with the trial sticks, etc., as regards heat, and if still too high the heap must be opened out again to cool and be reformed in the course of a few hours as before, when it will be found that the heat will have dropped to about 85° or 90° , and ready for forming the beds. The work of opening up the manure again in removing it to the Mushroom house will further reduce the temperature a little, bringing it down to about 80° or 82° , which, as we said before, it should be at the time the beds are formed.

Before leaving the important subject of the manure let us again reiterate the vital points to observe in its

fully washed out with quicklime. When the manure is brought into the house it should first be placed loosely in the beds, and allowed to remain so for a few hours to let some of the steam pass away. As soon as this has subsided the grower must then begin to form the bed, beginning at the most convenient end. The same principle of making the bed applies to beds of all shapes, and in various positions, according to the system to be adopted, therefore the mode of making the bed described here will equally apply to forms of beds under other systems. The grower should be provided with a wooden mallet and ram the manure well down as the work proceeds till a depth of nine inches is secured. After all the available manure is worked up in this way the bed should be as hard as a board, and to make sure that it is so give a good treading down with the feet. A hole should now be dug out (in the middle of the bed) with a small trowel, large enough to place a small thermometer in. After placing it in cover over with manure, and indicate the place with a small label. After the lapse of twelve hours the temperature should be ascertained ; it will probably stand at about 80°. If the manure is in proper condition the temperature should rise within the next twelve hours from 85° to 90° ; the thermometer should be examined again at the end of another twelve hours, when the heat will probably be found on the decline, and as soon as it reaches from 80° to 82° then is the time to insert the spawn. Should it happen that the manure still inclines to rise

in temperature then the preparation has been faulty, in so far that fermentation has been defective ; and rather than let it overheat itself the bed should be again thrown open to cool and then be reformed as before. It is, however, seldom necessary to do this.

Spawning.—Old and partly spent spawn is useless ; without healthy and active spawn good results are out of the question.

The size of a brick of spawn is usually six inches by nine inches ; this should be broken up by the hand into from nine to twelve pieces, and these pieces inserted in the bed ten inches apart into small cavities previously prepared for them. These cavities should only be deep enough to allow the spawn to be embedded a trifle lower than the surface of the bed. The spawning being completed as far as the lumps are concerned, we have still left the loose spawn which has fallen from the bricks in the act of breaking. This should be carefully collected and spread over the surface of the bed. This finished, a thin layer of the same sort of manure as that forming the bed should be spread over the spawn, and the whole surface again well pressed down with the wooden mallet previously spoken of. Further operations for the moment must be governed by the temperature of the bed. If this is steadily declining and has reached, say, a point of 75° , then the bed must be sealed down. By this is meant that a layer of soil (the siftings of turf which has been used for potting form the best material) should be laid over the bed about half an

inch thick when finally pressed down. This soil when applied should be neither too dry nor too moist, so that it can be trodden down as firm as possible, and then well watered with tepid water afterwards and beaten with the back of a clean spade, so that the surface will appear almost as smooth as if coated over by a plasterer.

For the next month the cultivator will have little or nothing to do in the way of attendance on the Mushroom house. At this time of the year (September) his efforts must be directed to keeping the house as cool as possible, and all that is required is to damp the floor morning and afternoon with cold water. The house, of course, must be kept dark. At the end of a month after spawning the bed should receive a good soaking of water at a temperature of 80° applied through a fine rose water-pot. By a good soaking, is meant enough water to soak the crust of soil well through—but not the manure. The young grower must not be too anxious or too curious or look for quick results.

The Crop.—In about five weeks from the date on which the bed was spawned (the date must be indicated by a label) the grower's heart should be gladdened by the sight of small disturbances here and there in places all over the bed, sometimes in irregular patches and sometimes in long thin lines—caused by the activity and running of the spawn, which is soon visible in streaks of white—as if cotton thread were woven over the ground. Every day will now add to

the number and their size until, if all the conditions are favourable, the whole body of the bed is clothed completely with Mushrooms of the finest quality, a sight as pleasing and as interesting as any garden crop is capable of presenting.

Gathering.—Although a simple operation, a good deal of the success and duration of the crops depends on the careful way in which this work is executed. The Mushroom should be gathered when it is about three parts grown, usually about three inches across. If allowed to become larger than this the quality deteriorates, and useless exhaustion to the bed is caused. At the stalk of the developed Mushroom will be found clustered together a group of three or four tiny Mushrooms, more attached to the stem than to the bed. These will never attain to any further size or usefulness, and therefore if, in collecting the Mushrooms, the stalk be cut with a knife, as is the common practice, what remains of the stalk in the bed perishes as well as these tiny embryo Mushrooms, causing more or less decay and sourness, which is inimical to the success of succeeding Mushrooms. It will be gathered from this that Mushrooms should not be cut off with a knife. On the contrary, the Mushroom should be taken hold of by the hand, and given a gentle twist, when both the Mushroom, the stalk and all the spent part will come away together, leaving the bed sweet and clean, and in a most favourable condition for encouraging the growth of the succeeding young ones.

At this time of the year (October) little or no fire heat will be required, therefore the house will not dry very quickly, but the bed on the surface must never be allowed to become parched, and if bearing very heavily an application of warm water will be necessary, at least once a week, and sometimes twice. The paths and walls of the house should be moistened over at least twice a day, but not saturated too heavily. The first crop will remain in profitable bearing from a month to six weeks, and after this is exhausted the bed should be brushed over, clearing away any loose bits of soil that may be on the surface, and giving a good soaking of water at a temperature of 85° to which a little common salt has been added, a small wine-glassful to three gallons of water. Shortly after this a second crop should result, not so heavy as the first, neither will it last in bearing so long, however, it should give a satisfactory return. When this is over, as it will be in about three weeks, the bed is then exhausted and must be cleared out, making room for a succession of beds to be formed one after the other, according to the quantity of manure available. The last bed should be formed in the house about the first week in May. After this date the crop is not a profitable one in houses such as we have been considering, on account of the weather being too hot. After this date until September comes round again they will succeed much better in open sheds or even in the open air. Temperature and ventilation depend very much on the size of the house and

the number of pipes it is desirable to fix in order to obtain the maximum of heat in severe weather. A strong fire heat is at all times inimical to the well-being of the Mushroom. Two rows of four-inch pipes fixed each side the pathway not too near the beds will be ample. Should the weather prove very cold in the depth of winter, rather let the temperature fall to 53° or 56° than force the fire unduly with the object of keeping the house up to a normal temperature of 60° . The roof must be a sealed one on the inside, with lath and plaster, with ventilators in the apex at distances of twelve feet apart. Little or no ventilation is ever required, and the ventilators are fixed more for the purpose of letting out steam than for admitting the circulation of air.

Reason of Failures.—Failure, from whatever cause it may arise, will not be discovered until the bed has been made and the time has arrived when a crop of Mushrooms should be forthcoming. If a crop does not appear, say, within two months after spawning, the best thing to do would be to dig a hole in the bed to see whether it is wet or dry or whether the spawn has run or not. If it is dry and the spawn has partly run, the bed will be all right, and after a good soaking of warm water, at the temperature previously recommended, a good crop may confidently be expected. On the other hand, should the manure turn out to be wet, and no appearance of the spawn permeating the manure then the grower had better make up his mind to turn out the bed at once, as it is useless expecting a

crop under these conditions. The cause of the failure in the latter case has without a doubt been the too wet and overheated (at one time) condition of the manure, leaving it as it were dead and without any recuperative power. At another time the spawn may be at fault, or the quality of the manure, its having been collected from drugged horses, may be the cause. However, these failures are the exception and not the rule, and should be no discouragement to the increased growth of this crop as a commercial undertaking, especially in the suburbs of cities, where manure is plentiful and cheap, as it is one of the most remunerative crops of the garden to grow.

Mushroom Growing in Open Sheds.—The growth of the Mushroom in the open shed is had recourse to more in the private garden perhaps than in the market garden, with the object of securing crops in the hot weather from the end of June to the end of September, when they cannot be well grown in the Mushroom house proper. Any outbuilding will do that has a roof over its walls, but preference should be given to that part of it which may face the north. Here let a bed be formed exactly on the same lines as advised for the house (only it should be twelve inches deep) and spawned as directed as soon as the conditions are favourable, the surface soil smoothed and made firm. The same must be covered over to the depth of five or six inches with the long littery straw shaken out of the manure when preparing for the Mushroom bed. We are presuming that every precaution has been

taken in preparing these beds as directed for those in houses. In that case the grower need not trouble to examine the bed again at least for a month, unless he apprehends ravages from rats, mice or other pests, against which, of course, the beds must be protected. In about a month or five weeks at the latest, the straw covering may be removed, and the bed given a good watering with warm water, as recommended before, when the covering should again be placed on the bed. In about ten days or a fortnight after this, the grower should be rewarded with the appearance of what should prove a heavy and remunerative crop. When these beds are in full bearing the Mushrooms should be picked about three times a week. It is not desirable to uncover the beds oftener than is absolutely necessary, as the fact of having to remove the straw too often, however carefully the work may be carried out, is attended with more or less damage to the crop. The treatment for the second crop must be the same as that advised for beds in houses.

Out-of-door Beds.—This is the system most favoured, and almost exclusively practised by our market gardeners in the suburbs of large cities where manure is plentiful, especially round London, and where fabulous sums are said to reward the growers for their skill and labour.

By this method of growth it is possible to have Mushrooms every day in the year, and that without the protection of a building of any kind, and where the cultivator is well up to the business, and especially

when he can couple with it the trade of spawn making, this branch of market gardening is without doubt one of the most remunerative.

The out-of-door beds are formed in the shape of wedge-shaped ridges, and these measure, when they are built, rammed and completed, two and a half feet wide at the base, the same in height, and the ridge six inches wide at the top. The material for these outside beds had better have a larger proportion of short straw in its composition than advised for indoor beds, for the reason that the heat would be longer retained, and also that the rain would be more effectually thrown off during the winter. As soon as the beds are formed, and are in a condition to receive the spawn, insert it, taking care that the temperature is not above 82° and on the decline. These conditions being secured, the beds must be earthed up in a similar manner that Potato clamps are earthed up. When this operation is completed, the beds should have a good watering with warm water, and afterwards beaten with the back of a spade until the surface is of a pasty consistency. This will conserve the heat of the bed much longer than if left rough. During warm summer months the amount of necessary covering will be comparatively small, and the best material to use is the straw taken out of the Mushroom bed material. As winter advances, a heavier covering will be necessary, indeed, the condition of the weather must govern the amount of protecting material to be applied, and as long as

this is sufficient to keep up a temperature of from 45° to 50° on the surface of the beds, it is possible to have Mushrooms off these beds even in the coldest weather in winter.

During winter these beds will require little or no water, but in spring and summer it must be applied liberally two or three times a week, and after the flush of the first crop is over a good soaking of manure water from the cow or stable yard often works wonders in securing a good second successional crop. In the spring and summer the grower must be on his guard against allowing these out-of-door crops to become too dry, because once allowed to become so it is most difficult effectually to saturate them afterwards.

The Artificial Cultivation of the Mushroom in Pastures.—The only way which suggests itself to us in which this can be successfully carried out is by digging holes in pastures that are well drained, and the soil of not too heavy a texture, and inserting in these holes, which should be twelve inches deep and the same in width, as much manure (prepared in the same way as advised for beds) as will fill the hole within three inches of the surface, leaving room to cover the hole over after the manure and spawn are inserted with the turf three inches thick. The manure should be rammed into the hole as tight as possible, and the spawn, a piece about four inches square, inserted at the same time, as there is no danger of this small quantity of manure overheating. Finish the

work by placing the turf over the hole, and treading the same with the feet as hard as possible. Should hot weather soon follow after this work is completed it is most likely the turf might be killed, and as it is not desirable that water should reach the spawn or the manure at this stage, cover each turf over with half a spadeful of mould or earth of some sort. This will keep it moist and fresh until it has had time to strike fresh roots and begin to grow again, which it soon will do when it feels the influence of the manure. As regards the season of the year in which the spawn should be inserted any time during the month of May will answer well. Before this time the earth is too cold and would have an injurious effect on the spawn, and should the season be a late and cold one, defer the work until the last week in May. Should the summer prove dry and hot give a good soaking of water towards the end of July, and with this and warm showers afterwards abundance of Mushrooms should result towards the end of August, through September, and well into October, and in due season for years afterwards.

How a Cottager can grow his own Mushrooms.—The artisan, or labourer, can grow his own Mushrooms. To show it is possible for the ordinary working man to become proficient in the work one may instance a man well known by repute to the present writer. He was a carpenter by trade, always having a fondness for gardening. His health failed and he was advised to follow an out-of-door occupation, and his fancy turned in the way of growing Mushrooms for market. He

started in a small way by growing them on the same principle as that adopted by market gardeners. At first he attained to modest but encouraging success, went on little by little until after a few years he became one of the largest and best-known Mushroom growers in the neighbourhood of London, supplying Covent Garden with many tons of Mushrooms in the course of a year, as well as having established a large and lucrative business as a spawn manufacturer. This illustration is given as showing that no special training is required to qualify for the work, and not with the idea that the carpenter should forsake the bench and turn Mushroom grower. The workman who may decide to try his luck in this way should well study the details given as to the treatment and preparation of the manure, as on this operation hangs more than on any other the success, or otherwise, of his labour. He will find the out-of-door system on ridged beds one of the best ways in which he can start, and this he can practice in his small garden, and failing this in his backyard. Another excellent position to make up a bed is in a cellar, or any underground or unoccupied room. The condition in any subterranean position of this sort suits the requirements of the Mushroom admirably. It is in the catacombs of Paris where most of the city Mushrooms are grown. Failing any of these conveniences a good way is to place manure in any odd boxes there may be to spare, and place them in any odd corners of rooms in the house, the cellar, or the attic, or any other convenient space that can

be spared. The boxes should be a foot deep and, after being filled with manure and placed in position, should be covered over with a bit of dry hay, and an old newspaper nailed down over the box. If the time is spring or summer the boxes will need watering with warm water (luke-warm) at the end of a month, relaying the covering. On examination again in about a fortnight's time the Mushrooms should be making their appearance regularly and will do so for six or seven weeks or more. During the winter season in this rather damp position very little watering will be required, and none should be given unless the surface of the soil should appear parched and dry. It must not be supposed that there is any offensive smell from these boxes ; they are perfectly sweet and without odour.

The boxes may be spawned and soiled over immediately they are filled, as with a small body of manure like this, there is no danger of overheating if the manure has been properly prepared.

The Manufacture of Spawn.—This is now practically a lost art among private gardeners, Chatsworth being the only private garden where the article is of home manufacture. Better crops of Mushrooms have never been grown anywhere than from the home-made article, one of the reasons for this being that the spawn was fresh every year, and not kept over from the previous season.

The work of making the spawn is a very simple matter, and once the details are understood, a handy and careful labourer can manage the work splendidly.

Quantities will of course be decided by the amount of spawn required, and the principle of making is the same in large and small lots.

Take a barrow load of soft cow dung, the same of horse droppings, and the same of mould or garden soil. Mix the whole well together, and by watering bring the material to a consistency of dough. Have ready moulds made of any rough bits of wood, nine inches long, six inches wide, and two inches deep. Place the material on the potting bench or some other convenient place, and commence to fill the moulds. This is done by placing the mould on the bench, and filling it with the stuff, ramming it in as hard as possible, and finishing the brick off nicely level with the edge of the mould. Have ready in the middle of an airy shed a shelf placed in such a position that the air can play round it from all points. On this place the mould sideways up, not flat. You will require to have the same number of moulds as the number of bricks you intend making (once made they will last for years).

When the moulds are all filled and placed in the shed to dry they will require no further attention for, say, ten days or a fortnight, by which time they will have attained such consistency and toughness as to be in a condition to bear punching fine shallow holes in each, one at each corner and one in the middle ready to receive the spawn. Upon the quality of the spawn will depend almost entirely the success of the operation. Under proper conditions the vitality of spawn may be preserved for a number of years, the length of time

depending on the temperature and dryness of the atmosphere in which it is kept. The mycelium of the Mushroom is of so sensitive a nature that once it is exposed to over moist or too warm an atmosphere, it commences to grow and spread after which its power for producing satisfactory crops is all but destroyed. Spawn therefore to be satisfactory should not be more than a year old, and be kept in a dry storeroom, where the temperature in winter ranges from 45° to 50° and in summer it should be kept as cool as possible. To find out the quality of the spawn, break up the brick into four or five pieces, and if it is permeated with a network of the most minute, threadlike veins, nearly of the colour of flour, you may be satisfied that your spawn is all right, if, on the contrary, these threadlike veins are swollen and spreading more or less about, you may conclude that fermentation has taken place at some time to the detriment of the spawn. Sometimes only a part of the brick may be affected, the other portion being all right. In any case doubtful spawn must not be used in impregnating the new bricks. Shallow holes having been made in the bricks as advised, a lump of spawn must now be placed in the holes about two inches wide by one deep, well pressed in and sealed over with some of the soft material left from forming the bricks. As soon as this sealing material is sufficiently dry, which will be in the course of three or four days, the bricks should be turned out of the mould, and built up on the top of one another, sideways and crossways,

leaving small spaces between for a small quantity of air to permeate the whole heap. The heap may be built up of any size according to the number of bricks to be dealt with, but four feet square and about five high is a convenient size. They should be stacked in a fairly warm room, and covered over with a quantity of littery straw or mats. This in the course of a few days will generate more or less heat, and this, of course, is the object in order to induce the spawn to run and permeate the brick, which it will do in the course of nine or ten days when the covering may be taken off, the bricks allowed to dry and harden, when they may be stored in proper quarters until wanted for use.

A thermometer should be placed in the heap and carefully watched, and the heat should range from 60° to 65°. The bricks must not be exposed to this confined heat an hour longer than is necessary for the filling of the bricks with mycelium. This can be ascertained by breaking up a brick or two. Spawn may be manufactured at any time of the year, but the best time is September, when the mycelium naturally spreads out of doors in our fields.

PARSNIPS.

There are very few varieties of Parsnips, and what there are have long or tapering roots. We see too frequently at exhibitions roots of abnormal length and quite unfit for cooking. Sometimes the roots

are three feet in length, showing how deep the soil has been worked, but roots as long as this are generally coarse and "watery". Good, well-flavoured roots, with a marrow-like flesh when cooked, should be of medium size and length. Thus it is unwise to sow seed on ground that has been recently well manured; indeed, if following some other well-manured crop then are conditions far more favourable for the production of good, edible roots. Because the Parsnip is hardy, seed is sown as early as February and March, but the wiser course is to hold over the sowing until the end of April, as then growth is more continuous, and the roots are smaller. The roots are so hardy that they may be left in the ground all the winter, being lifted for cooking as needed. To protect the crowns draw some soil in ridge form over them in November, and to enable this to be done lift and store every alternate row in dry sand in a cool place for the winter, and thus ensure an ample supply during severe weather.

The best varieties are the Hollow Crown, Tender and True, a somewhat "coloured" selection from this variety, and the Student, an old but excellent Parsnip. Sow seed thinly in shallow drills, drawn with a hoe fourteen inches apart, and when the plants are well up thin them out to six inches apart. The only after attention necessary is to keep them clear by frequent hoeing for the rest of the season. It is a common practice, when the ground is naturally stiff, to make holes two feet deep in rows, and fill them with sifted soil, then sow three seeds on the top, thinning the plants



CUSTARD MALLOW IMPROVED WHITE AND PRINCE ALBERT (TOP VARIETY).



A COLLECTION OF EXHIBITION VEGETABLES.

to one only ; other roots may be treated in the same way.

PEAS.

The Garden Pea is one of the most important and popular of vegetables, and when well grown gives a good return for labour. Few vegetables of late years have been so greatly improved ; the newer acquisitions are of better quality and more free than the older types, and there has been a distinct advance in the early section. One point often overlooked is that the Pea, to make a success of it, must have a rich root run. When starved the results are poor, and then the variety is frequently blamed, whereas it is simply the way it has been grown that is at fault. Another evil is sowing too thickly in the drill ; it is impossible for the plants to make sufficient roots to build up a strong plant when crowded together, and the result is that the effects of heat are quickly felt.

A deeply dug and rich soil will prove satisfactory, and it may even be necessary in the case of early Peas to sow thickly, as with the Tender Marrow varieties sown early some of the seed may fail to germinate. It is very easy to thin out judiciously should good growth follow. Thinning is not practised as much as is often essential. Mid-season and late crops need more manure than the early ones, and in heavy or clay land the upper soil should be well worked and pulverised by the weather, so that at the sowing time the seeds can germinate freely.

The earliest Peas, either of those sown or planted out, will be of dwarf growth, that is, will not exceed three feet, often less, and for these the soil is specially prepared, selecting a warm border for the sowing. A border of this kind is essential for the first crop, and a large mass of animal manure may be dispensed with. The ground must, however, be in good condition, as once the plant is in active growth there is only a short time to mature the crop. In gardens where the soil is poor, it is very easy to enrich it, and add, if necessary, lime dressing or calcareous materials. It will be seen therefore that the earlier sowings need a lighter soil, but later ones do well on a well-manured, deeply dug and strong loam. Many vegetable growers prefer land that is trenched or double dug for the later crops, and when the manure is freely given, and at the time of digging, place it in layers between the two spits in digging or trenching. The roots will thus have a good root-hold at the time there is a greater demand on the plant, that is, when the pods are in course of formation.

In many gardens it pays to grow late Peas in trenches in a similar way to Celery. Trenching previously is not necessary, but is an excellent plan in light soils on gravel, if the food in the bottom of the trench is dug in previous to sowing the seed. When growing in trenches, give plenty of space between the rows, and also in the row when the varieties are of strong growth.

Forced Peas.—No book on vegetable culture

would be complete without reference to plants grown under glass from start to finish, or raised under glass and then planted out. Few can devote the space to growing Peas entirely, but a few remarks will be useful. Frame culture is best, *i.e.*, growing the Peas in beds, although fair results follow pot culture when a very early supply is desired. Sow the seeds in frames in December, in rich soil in rows two feet apart, and eighteen inches from the glass when the plant is of strong growth of the Gradus, Daisy or Edwin Beckett type, but eighteen inches will suffice between the rows if such varieties as Chelsea Gem, Marvel and Sutton's Seedling Marrowfat are selected, and even less space between Harbinger, Sutton's Forcing and Green Gem. For pots, the last-named half-dozen varieties are excellent, and succeed well when sown in eight- or ten-inch pots at the start. Fill the pots three parts with rich soil, and make firm, and later on give a top dressing. Avoid crowding in the pots, and thin the plants early.

On the other hand, excellent results follow sowing the larger varieties in pots, and pinching out the points of the plants when two feet high. In all cases, even with the smaller growers, stakes should be used, for Peas both in pits or pots do better when supported, as the shoots soon twist and with the weight of the pods break unless staked. Peas sown under glass should be freely ventilated at all times in fine weather, and avoid strong heat; 50° to 60° should be the maximum in cold weather, as the object from start to finish is to grow the plants as sturdily as possible. Plants in pots

may often be given space in vineries or peach houses, but they must always be near the glass on shelves or stages in the front portion of the house, otherwise everything is labour in vain. It is useless to attempt their culture under trees.

Planting out from Frames.—Another and more profitable method is to start the plants under glass, and then plant them out, and this plan was largely followed in the gardens at Syon House, Brentford. Mr. Wythes describes his practice as follows: "Seeds are sown early in December, but in all cases fresh seed is sown, that is, seed from plants grown in the current year. The seed may be sown in three-inch or five-inch pots—I prefer the larger size—with from eight to a dozen seeds in each; the soil in the pots is firm and a good loam, so that at the planting out the roots do not break away. The pots are placed in a cold frame, kept quite close, and the glass is covered in cold weather. When the frame is kept close, the seeds start earlier, and the seedlings are more regular in growth. The sashes are not opened until the seedlings are well through the soil, then free ventilation is afforded on all favourable occasions. Frame culture is better than growing the plants in houses, as under the former treatment the plants are near the glass, and can be well hardened previous to planting out; indeed, I do not advise raising in heat, as plant grows away freely at the start, and later on receives a check from which it rarely recovers."

Varieties for Under Glass.—With regard to the

varieties to sow, there is a splendid choice. The best of the Marrowfats are available, and it is not really necessary to grow the small early varieties, as some of the second earlies or even other fine sorts do well treated in this way. Any of those named above for frame culture may be grown, or larger kinds such as Daisy, Gradus, Stratagem, Thomas Laxton, Duke of Albany, Eureka, Peerless Marrowfat, Edwin Beckett, Main Crop and Early Giant. Any of the strong-growing three-feet Marrowfat varieties will give a full crop grown thus, providing there is good culture. Coddling is a mistake. The object is to obtain a strong plant to put out early in March on a warm border, and making the ball of soil and the roots firm with the hand at the time of planting.

There are other ways besides pot culture, such as by sowing in pieces of fresh turf, cut thick, with the grass side placed downwards, making a depression in the turf, then sowing the seed and covering over with fine earth. The turves are placed in the frames, and when ready lifted carefully, and planted in deep drills, with as little disturbance of the roots as possible. This method saves the trouble incidental to pot culture, but the latter is preferable, as it is found that the plants grow away more freely, and can be transferred from their growing quarters at any time, if necessary. The plants raised thus do well in rows three feet apart. When they have grown from two feet to three feet stakes are given. Pinch out the tops of the shoots as soon as the flowers begin to show.

The First Crop.—Doubtless the most important outdoor crop where glass is not used is that known as the “first early,” as Peas are required as early as possible. There has been a great advance of recent years on the old varieties, such as the Small White and Blue Round, these being superseded by those double the size, both in pod and individual seed, and they have also a little of the delicious Marrow flavour. The newer varieties are quite as hardy as the older, and enormously prolific. We mean Peas like Acme and Bountiful, two of the very best Peas in existence for first crop on sheltered borders. No Peas equal Bountiful for sowing in heavy soil, this medium being unsafe for the true Marrowfats. Although Bountiful is a round-seeded variety, it is a distinct advance in this section, and the most productive of all the early Peas. To this variety may be added Chelsea Gem, Exonian, Wm. Hurst, Daisy, Mayflower, Little Marvel, Harbinger and May Queen. When the seed is sown in February or early March, according to the season and locality, the plants prove quite reliable. The distance to sow will depend greatly on the height of the plant. A twelve-inch variety will only require half the space needful for one that grows two and a half feet or three feet. Such varieties as Bountiful are most satisfactory when the rows are three feet apart although two feet may suffice, but the space between may be used for a single row of Lettuce or early Forcing Cauliflower, and there is no waste. All may not have a warm border, and be compelled

to grow in the open, then choose varieties of strong constitution, of which the Daisy and Bountiful are excellent types.

Second Crop.—In gardens where the soil is light, the best of Marrowfat varieties may be grown, but in gardens having a wet or clay soil the best crops are secured from what may be called the main crop or third section. Second crop Peas give a supply in June and early July, and the seed is sown from March until May at intervals of a fortnight or three weeks, according to the demand, as the May sowing is greatly influenced by the weather, which in July is frequently very hot and dry. The manure question is of the utmost importance in growing the main crop of Peas, and there should be no stint in light soils. Always, if possible, prepare the land for this crop some months in advance, and although the second lot may with advantage follow Celery, if sown in soil that has grown an exhaustive crop give ample food. There are plenty of excellent varieties. Most of the three-feet Peas mentioned above are suitable, and to these may be added Veitch's Main Crop, Model, Telephone, Duke of Albany, Criterion, Perfection, Defiance, Prize-winner, Peerless Marrowfat, Eureka, Masterpiece, Satisfaction and Centenary Marrowfat. An excellent new variety is Edwin Beckett which is represented in the illustration. This list could be greatly extended, but is given to show the type of Peas. Give ample room, both in the row and between the rows, between five feet and six feet between the rows being none too

much for the stronger growers. Thin out the seedlings early if the seeds are sown thickly.

Third Division.—In this division several of the best kinds mentioned in the earlier or second section are suitable if the soil is heavy or the position late. For instance, in the northern part of the country, the last half a dozen varieties named would do well, and much the same routine is necessary as regards sowing, but in some seasons the weather is not suitable. Always sow early in June for a large supply in autumn, rather than late in July. From May to the beginning of July is the best time to sow the Main Crop varieties, and the plants from June-sown seed in land prepared as advised do not fail so often as when sown later. It must be remembered, however, that in thin, light and gravelly soils, and a parching summer, with little or no moisture, even the most skilful culture fails to produce proper results. Choose strong-growing varieties, those that do not produce the crop all at once, that is, give one supply and all is over. Any of the Ne Plus Ultra type are the most suitable for the season named, and though the plant is six feet high it crops splendidly when given ample food in July and August, and even much later in the north. Such varieties as Autocrat, a grand Main Crop Pea, Alderman, Gladstone, Sharp's Queen, British Queen, Continuity, Windsor Castle Marrowfat, Exhibition Marrowfat, the Reading Giant and Quite Content, are the best of Peas for the season named, that is, to give a supply from July to September.

Late Peas.—Probably it is more difficult to grow

late Peas in many gardens than any of the other three sections described. In the south early Peas can be obtained more readily than very late ones, but in the northern parts of the country there is no great difficulty in having good Peas until the time of frost, the cooler weather and increased moisture favouring growth. In the south many schemes must be adopted to secure a crop as late as possible, and the dwarf early or round Peas are frequently sown at the end of July on a north border for late supplies. Even in this section there are some splendid late varieties, such as Late Queen, Latest of All and Gladstone, and to this number should be added Carter's Michaelmas, one of the finest of the late Peas. Many gardeners declare that no Pea is superior to it for the latest crop. When the seed is sown in June on an open border, a supply may be secured well into October, indeed, this variety is often excellent in northern gardens until November. Late Peas of the tall kinds such as described should be grown in an open position away from trees, and success depends upon the soil and situation. In a good loamy soil deeply cultivated there are few difficulties to contend with. In dry seasons the seed does not always germinate freely, but when deep drills are drawn or the seed is sown in trenches, the latter can be easily flooded to assist germination.

THE POTATO.

The only vegetable we cannot dispense with on our dinner tables all the year round, hence not only

good hardy varieties, all greatly help to prevent disease. The Potato disease seldom inflicts much injury on the Potato crops.

Good Varieties.—First Earlies, forcing or frames : Early Ashleaf, Midlothian Early, Ringleader, May Queen and Duke of York amongst the kidney varieties, and Harbinger, Sharp's Victor and Sutton's A.1. of the rounds, are the best. Good Second Early and mid-season varieties are the kidney potatoes Snowdrop, Early Puritan, Sir John Llewelyn, Sutton's Favourite and British Queen ; and Russet Queen, Maid of Coil, Dalmeny Acme and Herd Laddie of the round section.

Late Varieties.—Kidney : The Factor, Ideal, Chancellor, Up-to-Date, Highlander, Nobleman and Main-Crop. Round : The Crofter, Sirdar, Windsor Castle, Abundance, Duchess of Cornwall and Snowball. These are all whites. A few good coloured are—Kidneys : Queen of the Veldt, King Edward VII. (red) and Edgecote (purple). Rounds : Reading Russet (red), The Dean (purple) and Dalmeny (red).

RHUBARB.

Although an inferior vegetable, no garden can well dispense with Rhubarb. The stem product, which is the part consumed, is of the utmost service for making pies, for stewing or preserving at a time when fruits generally are scarce. Rhubarb has such a long season that it is forced for sale early in January, and can be had until the end of June if needed. Rhubarb re-



GLOBE ARTICHOXES



THE GREEN LONG POD BEAN.

quires a good holding soil, but where it is naturally light, and the sub-soil gravelly or sandy, it is a good plan, in preparing the ground, to throw out the top spit of twelve inches deep from a trench three feet wide, to add to the bottom soil a heavy dressing of half-decayed manure, which should be forked in and mixed with that, and to re-fill the trench, adding more manure with the top soil, then putting in roots, so that the crowns are level with the surface, four feet apart in the row. So treated the roots quickly become strong, also the leafage and stems, and will in a year or two produce an abundance of fine stems through the season. Where the soil is naturally good and loamy below the top spit, although it is well to break it up deeply and to add manure, a less heavy dressing suffices. It is a good rule to plant Rhubarb roots either in one corner of a garden or in one or more rows across a garden quarter, or if on an allotment in the same way, as, being of a permanent nature, the general cropping of the ground is little interfered with. Rhubarb is a gross growing plant, needing liberal feeding with ordinary manure, with nitrate of soda or with liquid manure.

Good varieties for forcing are Hawke's Champagne, Sutton's Rhubarb, Daws' Champion and Victoria. All these are equally good for planting to pull from in the open ground, indeed, none can be better. With regard to the great value of Rhubarb for forcing, it is important that the best varieties for this purpose be also grown liberally outdoors, as it is only in this way the stock of roots for forcing can be maintained. To gain that end

the proper course is to plant small roots every year, and thus maintain a constant succession. In that way in the fourth year the roots are large, and full of strong crowns. If they are lifted and divided so that to each crown a piece of fleshy root is attached, the work of propagation is made easy and certain. All the other roots may be lifted a few at a time, and if placed in any dark cupboard, cellar or forcing house, with soil about the roots, and watered, growth follows quickly if there is gentle heat to promote it. If no heat be given growth is necessarily slower, but with a good quantity of strong roots the produce will give frequent pullings until stems are available outdoors. Roots of the next size left in the ground will be greatly helped by placing over them casks or tubs, without top or bottom, but with a loose board placed over each top. Coat the tubs round with long manure or litter or leaves to exclude light and air, and to generate a little warmth. Growth in that way can be excited fully a month ahead of the uncovered crowns. But these come on in due course, and thus the Rhubarb season is greatly prolonged. Very often the second or autumn stems furnish excellent material for wine making.

The Rhubarb plants may be raised from seed, but the varieties resulting are seldom satisfactory.

SEAKALE.

This is one of the most popular of vegetables on account of its value in winter, as there is no difficulty

in having a supply from November until May when there is, unfortunately, a very restricted choice of other things. Seakale is best raised from cuttings, not from seed, unless a quantity of plants is required. There are very few varieties, the Ordinary Pink tipped, and the newer Ivory White being the best. Of late years others have been introduced, but their merits are not yet thoroughly known.

Forcing.—Seakale is now forced so largely that roots are specially prepared for the purpose. The old method was to force the same roots year after year, large pots being used with a loose lid or cover to allow of easy cutting of the Kale. The rows were four to six feet apart, with a distance of about three feet from plant to plant. Frequently, when new plantations were made the seedlings were sown the previous year, and then lifted and planted in threes or fives to form a clump, the soil being deeply dug and well manured. Roots grown thus lasted many years. The plants in October or November or later were covered over with the pots, a covering of fine ashes placed over the crowns first, and then large quantities of manure or fresh leaves and hot manure, some four feet in depth. Of course, the Kale was ready according to the warmth or quantity of manure. Seakale grown in this way, if not steamed too much, was of excellent quality, the only fault being that if the heat was too great or too sudden the growth damped off.

Forcing Indoors.—The modern way of forcing is to place roots in fine soil in a dark warm place. Often

a Mushroom house answers well, but it must be dark as the growth soon loses its whiteness. A temperature of 55° to 60° will grow good material, and, to get a first supply earlier than Christmas, place the roots in a bottom heat of 80° to 90° and when growth begins give ample supplies of tepid water and daily dampings overhead. To maintain a supply place roots in the house every three weeks in the quantities desired. As the season advances less warmth will be needed, the plants starting freely. To grow material for this purpose save the thick thong-like roots, which should be cut into lengths of from four to six inches. Make a straight cut at the crown or top, and a slanting one at the bottom. Tie these root cuttings in small bundles, and plunge in loose soil in frames; they will start into growth by March, and may then be planted in well-enriched soil, two feet apart between the rows with half this distance between the plants. Keep them free from weeds and apply a good fertiliser or salt and soot in showery weather. Good plants can be got in one year, but the results are better from two years' growth, and unless space is plentiful and labour abundant, it is wiser to purchase roots specially grown for forcing. Roots also force well in cellars or in boxes or under the stages of houses; but there must be darkness with only sufficient moisture to promote growth. Produce can also be obtained by placing roots in large pots in leaf soil just level with the crowns, and then cover with another empty pot, indeed, the forcing is most simple, and anything that will promote growth will suffice.

Large growers adopt quite a different system, but this is to get quantities of Seakale at one time. Wide deep trenches are cleared out, and the roots placed in the soil rather close together, many hundreds being in one trench. To get quick results hot manure is sometimes placed under the roots, but this is not a common practice ; the usual way is after the roots are placed in position to put framework over them, then mats, and over all large heaps of fresh manure, not only on the top but round the sides. No moisture is given. The Seakale soon starts into growth, and large quantities are cut at one time.

Late Seakale.—This is the simplest phase of Seakale culture ; the plants are not forced but only retarded, as the desire should be to get as late a growth as possible. Grow them in rows three feet apart with half that distance between plants in the row. Young plants are preferable, namely, not more than three years old, when they are cleared away, as it is advisable to make a new quarter yearly. Seakale may be raised from seed or cuttings. To plant new quarters the land should be trenched with a liberal quantity of manure, and the soil should be loamy. Seakale likes a good firm soil. In February cover the crowns with fine ashes to keep away slugs, snails and worms. Then bank up the crowns quite two feet high, and as wide as possible, as unless there is plenty of soil over the roots the growths soon find their way out at the sides and turn green, when they are of little use ; indeed, in some soils three feet is insufficient. Kale

grown thus is more delicately flavoured than forced produce, and it should be cut daily when the points push through the soil. Boards may be used for covering, or pots, but remember to exclude light entirely, as the plant soon grows at this season. A supply may be had from the open ground from April to the end of May. It is useless to cover after growth is active; February is quite late enough, as in mild seasons the growth is early. If boards are used by the side of the rows for covering, they should be twelve inches deep, and laid on edge just outside the plants. If pots or pans are used they should be deep enough to allow of a free growth, as the Kale from the open is often as strong again as when forced.

Another way of getting late Seakale is little known. All have not the ground to grow late Seakale, but retarded roots can be bought, that is, roots that have been kept in an ice store. These brought out in sufficient quantities, and placed in a warm house, may be had ready for the table in less than three weeks. These crowns force easily, very little warmth is needed, and the season is greatly prolonged, but it is not wise to grow the roots a second time. Any that have been lifted and forced do not pay: prepared roots are not costly.

SPINACH.

Spinach is not so popular as many vegetables. At certain seasons of the year it grows like a weed, but at others it is a failure, even with the best

management, especially in hot weather when the soil is light or gravelly. Again, in the winter and early spring there is a short supply at times, frost soon injuring the leaves. To get good results well-manured land deeply dug will be best for what is termed the standing crop, that is, for the August sown seed to give a winter and early spring supply. For many years no one would think of sowing any other variety than the prickly Spinach for a standing crop, but we have several very fine varieties, one of the most famous being the new Carter Spinach, a large-leaved variety, very hardy and good at all seasons. Another good Spinach is Round Victoria, which is far better than the ordinary round summer Spinach, and very good for winter and early spring supplies, while it does not run to seed so quickly as the old varieties. The ground for autumn-sown Spinach should be deeply cultivated, and ample supplies of lime, soot and wood ashes incorporated with it, if there is the least difficulty in culture. One sometimes reads that it is useless to attempt Spinach culture in winter, owing to the bad attacks of wire-worm, but this pest is quickly destroyed by dressings of gas lime given some months in advance of sowing the seed. Spinach is generally sown too thickly. The wise gardener thins early and freely, leaving the plants from six to nine inches, that is when they are to stand for any length of time, with a distance of eighteen inches between the rows. Two sowings are advisable at times in genial weather. Spinach sown in July or August,

according to the locality, makes rank growth, but by sowing thinly a second time in September a splendid return is the result in spring, as it will last well till the spring sown proper turns in. The latter need not be thinned, as thinning out will be accomplished by the cutting for use.

The most important supply is that from May until the autumn. Give ample food, a well-drained soil, and for a very early supply a few rows on a warm, south border, sown in February or early in March will give plenty of produce in May. Another sowing may be made on an open border to form a succession. The earliest seed will give good results if sown between rows of dwarf Peas ; a single row will be best, and as the crop is soon cleared it does not interfere with the Pea crop. When the winter crop has been killed, seed may be sown under glass in small pots and planted out between rows of Peas as advised. By this plan quite a fortnight's time is saved, an important matter where there is a large demand. Spinach may, if necessary, be forced or grown in frames from January-sown seed. It will be ready in two months, but must be given plenty of air, as growth gets strong. To keep up a supply from May to October, sow every three weeks in sufficient quantities. Sow the seed thinly to obtain strong growth, and after May sow on a cool quarter, such as a north border, damping the plants overhead every evening after hot sunshine. Even then in the south it may fail, but in the southern counties grow the

New Zealand variety for summer supplies. This Spinach, though very tender, will give a full crop if the seed is sown in frames in April in small pots, and the seedlings planted out in rich soil three feet apart. Always give plenty of water, as it makes a rapid growth, and will continue to grow until cut down by frost. It may be sown in the open in May, but will not be ready until July. The Spinach Beet is also a fair substitute, but the leaves are not equal to the ordinary varieties. This sown in March will provide an autumn and winter supply. It is a long-rooting variety, and seed should be sown eighteen inches apart in the row, and nine inches from each other.

THE TOMATO.

Of all fruit-producing vegetables so called, Tomatoes are the most popular, and from one source or another are available all the year round. The supply, however, of home-grown produce, even with the aid of warm glasshouses, is restricted, whilst outdoor Tomatoes have a comparatively short season. Hence, to all who have no glasshouses or frames the Tomato is of less importance than many other vegetables. By far the greater number of home growers adopt outdoor culture, for even in cottage gardens and allotments a few plants are generally grown, and a handsome return in fruit realised.

Sowing Seeds.—Even outdoor culture is not possible without some artificial help in raising young

plants, as seedlings raised from an outdoor sowing in May would not have time to ripen a crop before the frosts. Plants may be raised artificially with simple appliances. Twenty seeds for example may be sown in a five-inch pot filled with good soil, then placed in a seven-inch pot, and stood inside a south window. Cover the pot with a piece of glass to assist germination or two or three or more such pots, according to requirements, may be sown with seed, then stood in a box six inches deep, capable of holding several pots, and placed outdoors in a warm sheltered place, and covered with glass with a sack over it at night, as a precaution against frost. Hundreds of plants could be raised slowly but surely, so as to secure stout, sturdy plants to put out of doors at the end of May. Where there is a frame or greenhouse, raising from seed is less troublesome. Seed should be sown at the end of March or early in April. The seedlings simply need, when three inches in height, shifting singly into three-inch pots, using good light soil, and in these they can remain until strong enough to plant outdoors.

Plants Outdoors.—Ordinarily the best outside position is against a warm wall or wooden fence, as the plants receive shelter and full sunshine. There they may be planted in quite ordinary garden soil, twelve inches apart, being loosely nailed by the main stem to the wall or fence, all side shoots being kept severely pinched out. Where there is no southerly exposure, a warm or fairly sheltered position in the garden should be selected, the ground deeply dug and moderately

manured in the winter, and allowed to settle down. Then at the end of May or early in June, put the plants out in rows two and a half feet apart, and eighteen inches apart in the rows. Fix a stout stake four feet in length at once to each plant ; it must stand a little more than three feet out of the ground, and the stem tied as growth proceeds. With all plants the pinching out of side shoots must be rigidly enforced. Very little water is needed in dry weather until some fruits are set and swelling, and when they are colouring heavy watering should be avoided. It is better to place a mulch of long manure about the plants to check as much as possible too much evaporation. It is sometimes wise with all Tomato plants to thin out the weaker or more irregular fruits on the clusters to get larger size into those that remain. Late fully grown fruits will ripen if put on a warm shelf, and green fruits make excellent preserve or pickle.

Where wood or wire trellises are fixed across a garden quarter Tomato plants put out twelve inches apart against them on the sunny side are easily trained, but unless there is some close backing, such as mat, straw frames or corrugated iron plates, the plants do not bear earlier than those tied to stakes. Good

Outdoor Varieties are, for the open air, Earliest of All and Magnum Bonum, of the corrugated form, Conference, Sunrise and Duke of York (smooth round fruit), Glory of Italy (plum-shaped with full clusters), and the richly flavoured Golden Nugget, a small-fruited and excellent variety for dessert.

Tomatoes in Greenhouse.—Where Tomatoes can be grown in a greenhouse, and there is a little artificial heat, seed may be sown in pots as early as the end of February, the seedlings being treated as before described, and either planted on ridges of soil or put into boxes or troughs or placed singly into nine-inch or ten-inch pots early in May, and thus secure a good start ; but much depends on the facilities at disposal. When plants are in pots they can be placed almost together in a row on one or both sides of the greenhouse, and trained up to wires or long rods fixed for the purpose some ten inches under the glass roof. Such plants may continue to grow and fruit as long as the house can be spared. When the flowers set well and the plants are from time to time fed with weak liquid manure or a little artificial manure they will carry great crops. When the side shoots are kept hard pinched out, the plants are not unduly crowded. Tomatoes under glass need plenty of air, and when in flower an occasional gentle tapping of the stems helps to diffuse the pollen, and assists fertilisation. Good varieties for indoors are Sunrise, Duke of York, Winter Beauty and Frogmore Selected.

Forcing Tomatoes in winter is always very difficult and unsatisfactory. Few fruits need more sunshine to mature fully than the Tomato, and that, unfortunately, no artificial treatment can supply in the winter. To have fruits late in the year, it is a good plan to raise plants from a sowing made in June, and to grow them on singly. When fifteen inches in height, shift them

into large pots. These should be encouraged by ample exposure to light and air to set fruit freely, and begin to form it by the end of September. Then if the plants be stood on a shelf close under the roof of a warm house, and trained up to sloping stakes or wires there should be a crop up to Christmas. A sowing of seed made at the end of January should give plants to ripen fruit in warmth at the end of April or early in May, as by that time there is ample sunlight. Earlier ripened fruits are poor.

VEGETABLE MARROWS.

Marrows belong to the same family as Gourds and Pumpkins. Although the edible Gourd is not much grown for consumption, it is most useful for soups and stews in winter, and may also be cooked in various ways as a vegetable. The Vegetable Marrow is the more popular, but even this occasionally receives scant justice. Huge Marrows with the seed almost matured are frequently seen, but the flesh is always dry and flavourless, whereas the Marrow cooked whole in a small green state, or cut into two and the soft or pithy portion removed, and the space filled in with minced meat, and the two halves tied together and cooked, makes a delicious vegetable, and that is only one of many ways of serving them. When the Marrow is grown on a huge rubbish heap, or a mass of decayed manure, an enormous plant is produced with few fruits. The reason is that the roots have

too great a run, and the flowers refuse to set. It is far better to follow the plan of the market grower, and plant in rows in a well-manured soil. Grown thus the growth is not so wild, and more fruitful. But market fruits are, as a rule, too coarse and large ; although, unfortunately, for the purposes of sale, size may be essential, it is not necessary in private gardens. It must also be remembered that no loss results from cutting the fruits when small, as three or more are produced in the place of one of big dimensions. Another point is that the small varieties of Marrows are not sufficiently grown, for the reason that they are more prolific and of better flavour. An excellent Marrow is the new Perfection, which is exactly the size for the table. Other good varieties are Pen-y-Byd and the Custard Marrows, which are far better than the old large forms which find so much favour.

Marrows in Frames.—The Marrow needs protection at the start, but the best practice is to grow the early lot in frames, as then a supply is obtained a month earlier, and at a season when they are appreciated. With such varieties as Perfection and Pen-y-Byd frame culture is simplified, as they produce fruits little larger than a cricket ball, and in great abundance if the plants are not given too much heat ; they make a short-jointed growth, and are grown in ordinary frames with a little bottom heat to promote a reasonably quick growth. Seed sown in February will result in seedlings ready to plant out at the end

of March, and early in May Marrows may be obtained at a season when choice vegetables are not plentiful.

Marrows succeed in cold frames with manure as the heating agency or in frames heated with hot water in moderation. Ample ventilation is needful in favourable weather, with a temperature of 60° at night, indeed 5° less will suffice at the start, and 10° higher by day. Grow them in good loam, and if they are inclined to run too much to leaf, take out the points of the shoots. Plants grown thus do not set their flowers freely if kept too close, so that ample ventilation must be given, with liberal supplies of liquid manure, damping the plants overhead early in the afternoon and when the frames are closed. Another point in frame culture is to see that there is only a mild bottom heat. Large masses of hot manure give out a too violent heat, so that it is better to use a good proportion of fresh leaves or manure fermented before use.

Marrows in the Open.—Marrows are easily grown out-of-doors, but even in this case timely shelter at the start is well repaid. As the seed is very fleshy warmth is necessary to germination, so that too much moisture must not be given until growth is pushing freely through the soil. The seed is best sown in pots, two or three seeds in each five-inch pot, or one in a smaller size. Place them in a warm house, or if a glass structure is not available plunge the pots in the warm manure in frames.

Wherever raised the plant must be above the soil

and near the glass, the old system of sowing a number of seeds in a pan or pot and, when large enough, potting up the seedlings singly not being advisable. The seedlings receive a check when separated, and may collapse unless there is a brisk bottom heat to help the new root growth. It will be early enough to sow seeds in April for planting out in May, and even then one cannot often plant before the third week, unless hand-glasses or a covering of some kind can be given, as the Marrow is very tender. Excellent results come from planting in frames which have had early Potatoes or Carrots. The shelter of the frames for a few weeks is exactly the thing needed, and once a good start has been made the frames are no longer required.

Another way is to place a large body of leaves, or, better still, leaves and manure together, in mid-winter, and plant on the surface, on which has been placed from nine to twelve inches of good loam for the roots. The leaves long retain the warmth, and if no glass covering is available anything may be used at night or on cold days to break the cold winds. Stakes and mats or even boxes or boards may be used as an early protection.

Late Marrows.—Marrows raised for a later supply will need less attention. Sow the seed in May, and plant out in June. Growth will be freely made if ample moisture is given. When a quantity of Marrows is desired dig out a trench a few feet wide, and eighteen inches deep, and fill in with hot manure, placing over this some of the soil taken out of the trench, and then sow the seeds, thinning to the strongest plants when

large enough. If the seeds are sown in groups or patches of two feet or more, and then covered with hand-glasses or, failing these, inverted flower-pots, the seed quickly germinates : the pots may be used at night for a while as a protective covering.

ONIONS.

Preparation of the ground is one of the first things that claim attention in growing Onions. It should be deeply trenched in the autumn, and have a liberal supply of well-decayed farmyard manure incorporated. It is a good plan to give a dusting of soot and bone-meal between the layers, and apply the same dressing to the surface, which should be left as rough as possible, so that it may be crumbled down by the influence of the weather. Before planting out the crop, level the bed and mark out the alleys ; then work the surface well with a fork, and rake it down until perfectly fine.

To obtain large bulbs it is necessary to make a start early in the year by sowing in boxes under glass at once, as this vegetable requires a long period of growth to bring it to perfection. A suitable compost consists of two parts fibrous loam, one part leaf-mould, and one part old mushroom-bed material, with a good sprinkling of fine charcoal. The whole should be thoroughly incorporated and passed through a

quarter-inch mesh sieve. Boxes two feet long, one foot wide and four and a half inches deep will be found suitable. Cover the seeds about half an inch deep, and then place the boxes in a greenhouse where a moist atmosphere and a temperature of from 55° to 60° can be maintained. As soon as the seedlings are large enough to handle, prick them off into rather deeper boxes, placing them three inches apart each way, and use the compost recommended above. When the young plants have started into growth, place the boxes in a rather cooler house, giving them a position near the glass, and syringe twice on bright days. About the middle of March place them in a cold frame, and commence to harden off early in April by removing the lights on all favourable occasions.

The third week in April is an ideal time to plant out the crop. Use a trowel for planting, and allow a distance of eighteen inches between the rows and fifteen inches between the plants. Dust over with soot occasionally. This will help to keep down the attack of the Onion fly, which often does much damage during the spring ; but it will be noticed that Onions sown in boxes and transplanted are not so liable to this pest as those sown in the open ground. When the plants have become well established, a dressing with some approved fertiliser should be applied about once in ten days.

Where sowing in the open must be adopted, the end of February till about the third week in March



*HOW RUNNER BEANS ARE STAKED IN ALDENHAM
HOUSE GARDENS.*



THE CELERY QUARTER IN LORD ALDENHAM'S GARDEN AT ELSTREE, WITH
LETTUCE PLANTED ON THE RIDGES.

is a good period, the date varying somewhat according to the locality and climatic conditions. The surface of the bed must be raked down fine, and then drills two inches deep and twelve inches to fifteen inches apart are drawn, the seeds being scattered thinly in these and finally covered with the fine soil. When this has been done lightly rake the surface level, and then either tread the soil firm or else pass a light roller over the bed, especially where the soil is of a sandy character, as the young seedlings delight in a firm rooting medium. As soon as the young plants are large enough thinning must be resorted to, and it is well to do this gradually, going over the bed at intervals of about nine days. By so doing there is less danger of over-thinning, which sometimes happens when disease takes the plants in their partially developed stage. Good and useful bulbs are frequently obtained from outdoor sowings, and practically all cottagers grow their Onions in this way.

Do not allow the crop to suffer from drought during hot weather, but give copious waterings with liquid manure whenever required. Keep the bed free from weeds, and make frequent use of the hoe. When the bulbs have nearly finished swelling, the most forward ones should be slightly raised with a fork to prevent their splitting ; also bend over the tops, as this will assist them to ripen. Choose a bright day for harvesting the crop, and be careful not to bruise any, or their keeping qualities will be considerably

diminished. By these means very fine bulbs may be grown, and if well ripened and stored they will keep satisfactorily. For exhibition purposes a strain of Selected Ailsa Craig cannot be beaten.

CHAPTER III.

THE HERB GARDEN.

THE term "Herb" is a common one in gardens, and is applied to certain plants, mostly hardy, grown for either flavouring or medicinal purposes. The flavouring and most widely grown section contains fewer herbs than the group grown medicinally. Formerly the medicinal herbs were held in high esteem, but the medical pharmacopœia has undergone vast changes, with the result that herbs are not accounted of so much importance. Still, in many gardens it is the rule to grow a few in case they are asked for. Herbs are both of annual and perennial character, all giving seed in their seasons, and all easily raised from seed, cuttings or division. Herbs are generally grown in a small separate garden or plot or "Herb Garden". Exception is generally made to Parsley which is in great demand for table decoration as well as for flavouring, and for that reason a good quantity of it is needed all the year round. As it is usually treated as an annual, seed being sown yearly, and sometimes twice yearly, it is necessary to give to it more space than is provided by an ordinary herb garden.

Flavouring Herbs.—The chief are Parsley, Mint,

Common and Lemon Thyme, Sage, Marjoram, summer and winter Savory, Chervil, Tarragon and Fennel.

Parsley.—This is usually raised from seed in shallow drills, either beside garden walks or on a border, the drills being twelve inches apart. The seed should be sown thinly in rows, and the plants thinned out to six inches apart when strong enough. The usual seasons are, March for summer and autumn use, and early in August for a winter supply. From this latter sowing transfer some of the plants into a frame six inches apart, or shallow boxes, so as to enable the plants to be housed during hard weather, and thus furnish leafage for garnishing. Parsley well repays for good soil, deep working and ample thinning. Excellent varieties are the Dwarf Garnishing and the Treble Curled.

Mint is a herbaceous perennial, and can be propagated by seed, by using the young tops as cuttings, and by lifting, dividing and replanting the white, fleshy, running roots. Solid clumps cut out from an old bed with a spade, and planted fifteen inches apart in fresh soil soon become thick. The best time for inserting tops as cuttings is in March or April, when the shoots are four inches high. The common garden variety is the Green or Spear Mint, as that gives a pleasant yet not strong flavour. In planting Mint in fresh soil, take great care to have the soil free from weeds, as the bed may remain in one position for many years. After the stems have been cut in the autumn, and hung up to dry for winter use, a dressing of short manure should be given.

Thymes.—Both Common and Lemon are dwarf, compact and evergreen. They can be increased by division early in the spring, replanting them at once, or the young points of shoots will soon root if inserted in pots filled with sandy soil, and placed in gentle warmth in a frame. Thymes can also be raised from seed.

Sage is an evergreen shrub of the *Salvia* family, and can be increased by cuttings in the late summer, or by breaking off branches and planting them in fresh ground, one half their depth. The plants are quite hardy, and if left alone will grow very broad in a few years. It is best, however, to plant some afresh every three years at least.

Marjoram.—There are two Marjorams—summer, treated as an annual, and raised from seed sown in shallow drills twelve inches apart in March, and the winter one, which is a perennial. The winter Marjoram can be increased by dibbling in slips into the open ground, by rooting tops as cuttings under a hand-light in the summer, and by lifting, dividing and replanting the roots in winter. It is usual to cut the stems off in the autumn, dry them, and store in paper bags for winter use.

Savory.—There are two forms of Savory also, annual and perennial. The former is easily raised from seed sown in shallow drills a foot apart in April, the seedlings being well thinned. The perennial can also be raised from seed, the young Savory plants being, when strong, dibbled out where they are to grow.

These should be fully twelve inches apart. This form can also be propagated by slips or cuttings. Plants will grow to a good size, therefore need ample room.

Chervil is a quick-growing annual. Seed should be sown in shallow drills in March, and each month for succession until August, when a sowing to stand the winter and produce seed the following year may be made. Very small sowings suffice.

Tarragon is a perennial, and has rather warm leafage; this is often used with cold salading to correct its coolness. Plants can be obtained by parting the roots in winter, and replanting into fresh, good soil. Leaves gathered in the summer and dried are very useful in winter. It is not much in request.

Fennel.—Fennel is a tall handsome foliage plant of which one or two suffice for most gardens. It can be raised from seed or by lifting and replanting of sets, or by dividing roots and replanting them. The flowers should be pinched out when seen. Fennel leafage is frequently used to flavour fish.

It may be mentioned that all these herbs do well in ordinary garden soil. They need to be kept clean, and an occasional top dressing or mulch in the winter of short manure is helpful.

Medicinal Herbs.—These consist of Balm, Chamomile, Rue, Wormwood, Pennyroyal, Peppermint, Tansy, Hyssop, and several others now rarely met with in gardens. Those mentioned are chiefly perennial, can be increased by divisions, by cuttings or

slips, and a few from seed. Practically, they need treatment similar to that advised for perennial flavouring herbs. Lavender is grown as a perfuming herb, and is easily increased by dividing old plants and replanting them.

CHAPTER IV.

VEGETABLES NEGLECTED IN ENGLISH GARDENS.

CARDOON.

THIS is not a vegetable for a small garden, as it needs considerable space, and does not pay unless as great a choice of vegetables as possible is desired in the household. It is closely allied to the Globe Artichoke, and is a great favourite on the Continent, where it is properly cooked. The seed is best sown in small pots early in the spring, in warm frames, and if three or four seeds are sown, the plants when large enough should be thinned to the strongest one, hardened off, and planted out in trenches in May or June, in the same way as for Celery, but they must have more room, not less than two feet between each tuft, and at least four feet between the trenches to allow for moulding up. Other methods are quite as good, but the produce is not so large, although sufficiently so for most purposes. One way is to prepare trenches early in May, and sow the seed in them at eighteen inches apart in the row, placing the seed in patches at the distance named, and thinning to the strongest. The Cardoon requires a good diet, and must have abundant supplies

of moisture ; indeed, Mr. Wythes writes : “ The best Cardoons I ever grew were the result of flooding the trenches with liquid manure weekly ”. If the roots suffer from drought the plants frequently run to seed, and are worthless. In gardens where labour is none too plentiful, and water scarce, it is a mistake to grow Cardoons. Where Cardoons are so much esteemed that a supply is desired in winter, then sow seed in June. The plants will not be large, but the flavour will be excellent. It may also be mentioned that there is no need to have enormous growths ; growths of five feet or more are quite needless. Cultural details are simple once the planting is accomplished. Give plenty of manure during growth, and keep the soil about them free from weeds.

There are several varieties, although only a few are enumerated in our home catalogues, but on the Continent about a dozen are mentioned. Whatever the variety, the aim of the cultivator must be to get solid stem growth which is the portion cooked, and varieties differ in this important point. There is the large Spanish, which is less spineless than some others, but runs badly to seed. The large Solid Tours is better ; it comes from Tours, and is an excellent Cardoon, so also is the Marseilles, and the Puvis, a variety much esteemed in France.

As the plant attains a good size, draw the leaves together when they are quite dry, and use haybands to blanch the stems. The leaves must be brought into an upright position, the bands being placed at the base,

and go on covering until the whole is bound round. Then bank the bands up with soil from the trench, so that air and moisture are excluded. The growths are ready for use when well blanched. Other methods of blanching are sometimes followed, but the best way is described.

CELERIAC.

This is well worth a place in all kitchen gardens, and few winter vegetables are more delicious. Celeriac reminds one of Celery in flavour, but forms a bulbous root, which does not require moulding up, and is hardier, whilst it is a great favourite on the Continent. The roots of Celeriac may be in season for six months, as if lifted in October, and stored in a cool place in sand or ashes, they keep sound for a long time. The seed should be sown as advised in the case of Celery, in heat in March, and the seedlings pricked off in boxes, or they may be transferred direct from the frames into their permanent quarters. The plants should be put out on the level in rows two feet apart and eighteen inches from each other in well enriched soil, somewhat light for preference, and in dry weather give liquid manure and plenty of water. At the time of planting trim them carefully, removing all side growths, as only one main growth is wanted. Upon the strength of the growth depends the size of the bulb or root. During growth the lateral shoots must be removed as they show as this strengthens the plant.

The after management is simple, and consists in feeding, and watering and hoeing between the plants. On the Continent, from where fine roots of this vegetable are imported for the London market, liberal mulches of decayed manure are spread between the rows, but by giving attention to cultural details, we can grow this plant equally as well in this country, surely a point not to be forgotten. It is not necessary to store the roots, as they winter well if clamped like potatoes, or the soil may be drawn well over the crowns in their growing quarters, but treated thus the plants are difficult to get when severe weather sets in. The usual practice is to lift a portion as required, leaving the remainder in the ground until wanted for use. There are not many varieties, but the Continental ones are best, such as the Large Prague and the Apple Shaped, the last mentioned being a thicker and more succulent root. The roots may be cooked in the same way as Beetroot, and used as a salad, but they are more palatable when cooked and served whole.

CHICORY.

This is not a favourite vegetable, but is esteemed in some households. Seed should be sown in March in drills in rows eighteen inches apart, and the plants thinned to half that distance in the rows. This will result in good roots for a winter supply from November to April. Place the roots in a dark cellar or Mushroom house, and in about a month the top growth



PEA EDWIN BECKETT.

in drills eighteen inches apart with half that distance in the row. To obtain large plants sow early in good loamy soil, but in poor or in very light land the plants run to seed when sowing takes place too soon. If newly manured land is used for this crop the roots fork badly and do not become straight, thick and fleshy. It is not well to lift the roots too early, indeed, if the plants are covered where they are with a little litter they will take no harm. Roots so wintered are of much better flavour than those in a store, as, if shrivelled, they lose their good qualities. *Scorzonera* needs just the same culture ; it is of a different colour and shape to *Salsify* but it needs deeper land, and the roots are small if not given good culture. Sow the seed early in May in an open position, in land as advised for *Salsify*, and at the same distance apart. The plants during growth give little trouble and succeed well in a good light soil, and may be served in the same way as *Salsify*. If only one of these vegetables is grown choose *Salsify*. The plants remain good from October until March, or later, but after that they begin to flower and get tough and juiceless. The best *Salsify* is the Mammoth or Giant, which is much superior to the older common form, and the large Russian is the best of the *Scorzoneræ*. *Salsify* is sometimes spelt *Salsafy*.

AUBERGINE OR EGG PLANT.

Although the Egg Plant is regarded almost as a curiosity, it is well worth frame or pit culture as a

vegetable, grown at the start somewhat in the same way as the *Capsicum* when the latter is grown for using green. The seed should be sown early in the spring in heat, and the seedlings pricked out like those of Celery, and when large enough planted out in rich soil in a frame or pit, from fifteen inches to eighteen inches from the frame or glass. Give the plants liberal treatment for a time, close early in the afternoon and damp overhead. The purple variety is the best when cooked, and both this and the other varieties should not be allowed to get too old before they are used. The Aubergine is a favourite in the United States, the New York Purple being a variety of excellent flavour. There is also a black fruit, a Chinese variety, that is of free growth, and these last two are excellent for general culture. When in flower it is well to give more ventilation and less moisture overhead, but when set they enjoy liberal supplies of liquid manure. If the plants are given a little bottom heat at the start, they grow rapidly, but red spider and thrips soon trouble the foliage, so that dryness should be guarded against.

SUGAR CORN.

This is not common in this country, but it is well worth a special note. In the United States Sugar Corn is largely cultivated for cooking, and should find more favour in this country as a vegetable. It requires a deep well-manured soil, and succeeds best in deep drills or shallow trenches, with a liberal amount of manure

for the roots. It is surprising how large an amount of moisture these plants will absorb, and the weight of corn they produce. Of course, as a vegetable the corn is used green, and to get early supplies it is necessary to sow in small pots late in March or early in April in cold frames, and plant out in rich land in May. Grown thus a very early supply is secured. Sowings made in the open late in April and May, in rows three feet apart, and half that distance between the plants in the row, will give excellent material. The seed should be dropped in patches at the distance named, and the seedlings thinned to the strongest. There are many varieties; the Early Dwarf Sugar, Early Six Weeks and Sweet Triumphant are among the best. The green cobs should not be allowed to harden, but cooked while tender and served with melted butter.

CHAPTER V.

VEGETABLES FOR EXHIBITION.

No branch of gardening deserves more encouragement than the culture of high-class vegetables. Good vegetables are one of the necessities of life, and it is profitable and pleasurable to grow them to perfection. During the past thirty years enormous strides have been made in their development, and this is greatly due to the encouragement in the shape of prizes offered at many of our large exhibitions, and also at our cottage garden shows held in many towns and villages throughout the country. Mr. Beckett writes :—

I hope I may live to see the day when a truly National Vegetable Society is formed, in which encouragement is given to the trade, professional gardeners, amateurs and cottagers. If such a society was once formed I have not the slightest doubt, if properly worked, it would prove one of the most useful and interesting of horticultural organisations. It is argued that vegetable exhibitions are not sufficiently beautiful or interesting to attract the general public, but I am convinced that this is not so. We have only to call to mind the interest centred in fine collections at such shows as Shrewsbury, London, Birmingham and Read-

ing, when valuable prizes are offered and the finest types of vegetables splendidly presented. Almost every vegetable during recent years has been taken in hand by the hybridiser, the result generally being better strains. Peas, Potatoes, Cauliflowers, Tomatoes, Cucumbers, Brussels Sprouts, Carrots, Celery, Vegetable Marrows, Cabbage, Onions, Beans of all kinds, Leeks, and many others have been greatly improved of late years. Those who are thinking and hoping to excel in the production of high-class vegetables must remember that much work and forethought are needful, but let it not be forgotten that even when one has no good position or ideal vegetable soil a splendid success is not impossible. There is no soil or position in the country that cannot be brought into a suitable condition for, if not all, the majority of vegetables. Those who persevere are the ones to succeed. Success is not a matter of mere luck as some imagine.

Preparation of the Land.—I regard this as of the utmost importance, and unless it can be brought into a good state of cultivation no amount of work and worry will ever produce the finest vegetables. Deep cultivation must be persisted in, and in spite of what other growers may say, I know from long practical experience that when this is systematically practised quite double and sometimes treble returns are assured. It is not so much a matter of size of garden or farm as the way it is worked. The land must be deeply drained, and the trenching practised if possible annually at no less a depth than two feet six inches or three

feet. Bring the bottom spit to the surface, and break up the soil deeply below with a fork. This will receive almost any garden refuse or manure which may come to hand, the longest and greenest being placed in the bottom, throwing on the surface spit, which will in time find its way to the top. Instead of about a foot or in some cases less of workable soil, one will in a short time possess a valuable depth of soil capable of producing good specimens of almost any vegetable. Of course it is essential to make stiff and retentive land light by working into it suitable material, especially so on the surface after the trenching is completed, such as wood ashes, old mortar rubble, and road scrapings. Stable manure somewhat green should be used in preference to any other on heavy land, and that from horned stock for lighter soils. Light land should be trenched during autumn and winter, but the stiffer soils as much as possible during February and March.

Rotation of Crops.—It is hardly necessary to dwell at any great length on this, as it is generally well understood by all who make any pretence at gardening. The sites for the different crops should be changed as far as possible each year, except in a few cases such as Onions, Shallots, Artichokes and Horse-radish, each of which, provided the ground is well replenished with manure yearly, may be grown on the same land for years.

Quality versus Size.—This question has been discussed many times. It does not always follow that size means bad quality. Good judges should be in a

position to determine this, but unquestionably size is far too often taken into consideration, especially in the case of such things as Potatoes, Cauliflowers, Cabbage, Vegetable Marrows, Cucumbers and Tomatoes. Potatoes particularly are shown too large, and medium-sized tubers of the finest quality should certainly be preferred to large ones, even though they may be shapely and of good appearance. Onions, Leeks and Celery, however, if of the best varieties, cannot be staged too large, for the reason that size denotes high-class culture and good quality.

Varieties to Grow.—It is well to remember that an inferior vegetable is as troublesome to grow as a good one; although the cost of procuring the best varieties in the first place may be somewhat more expensive, it is cheaper in the end to get the best, and when once in possession of any special strain endeavour to keep it by saving your own seed annually. This applies especially to Peas, Beans, Onions, Cucumbers, Tomatoes and Marrows, each being easily selected and saved.

Staging Exhibits.—Practice alone can make one perfect. The difference between a well set up collection of vegetables and one arranged slovenly is most apparent, and though there may be little difference in the quality of the produce in each case, vegetables well shown are certain to win, and rightly so, and the same applies to single dishes.

Judges.—Too much care cannot be exercised in selecting competent men for this most important and

responsible post. When this is done, no exhibitor should complain of their decision, although it may not always agree with his own belief. Much must be taken into consideration when judging vegetables, and nothing more so than the season. When making, for instance, awards through August and September during trying seasons, a good dish of Turnips perfect in every respect should receive the maximum number of points, but on the other hand, when the season has been favourable to their production, these should not carry much weight. Nothing is more easily obtained during a wet season, and nothing more difficult during a hot dry summer. Again, more attention should be paid to quality, especially in the case of Potatoes and Peas. Some varieties are all that can be desired as far as appearance goes, but are of the poorest quality when cooked. This is of the greatest importance. When judging fruit quality is generally the first thing considered.

GLOBE ARTICHOKE.

No dish is more appreciated by good judges in a collection of vegetables than that of Globe Artichokes when they are shown to the best advantage, but they are rarely cultivated except in large gardens.

To have heads of the best quality, trench the ground two and a half feet deep in the autumn and mix in with it some road scrapings and coal ashes, for which the Globe Artichoke has a particular fondness, if the soil be at all stiff. Leave the soil quite rough until

March so that frost and wind may penetrate it. Fork over the surface at the end of the month and procure suckers of a good variety.

Planting should be done during the second week in April, allowing a distance of three feet apart and four feet between each row. Plant very firmly and earth up with cinder ashes as a preventive against slugs, and in dry weather mulch with long stable litter, and water in.

Give plenty of liquid manure when the plants are in full bearing. If required for exhibition the Artichokes should be perfectly fresh, close at the top and of a good colour.

When the Artichokes are wanted late in autumn take heed of the weather and at the first sign of frost protect with mats or similar material. The heads can be cut quite ten days before the exhibition and placed in water with a small portion of the stem removed every other day and fresh water given.

The best results are obtained by making fresh plantations annually, and none of the old plants should be allowed to occupy the ground for more than two years. Take off young suckers every year during autumn and pot them up into six-inch pots and winter in a cold frame, or plunge the pots in leaves or ashes in a sheltered position such as the foot of a south wall where they may be protected during severe weather. There are many varieties under cultivation, but by far the best for all purposes is the Large Green Globe, which is free from prickles, and more tender than many

others. A few of the best brown variety should be grown for a change. Seedlings can never be depended upon.

BROAD BEANS.

Broad Beans even when at their best can only rank as a second-class vegetable, nevertheless it is essential always to have them ready during their season, as sometimes in large collections they will have to be included.

The first sowing should be made about the 20th of January in boxes two feet long, one foot wide and four and a half inches deep. This date will be found quite early enough for the first batch. Fill the boxes three parts full with a compost consisting of three parts light loam, one part leaf mould, and road grit all in moderately dry condition.

Thoroughly water in and place in a cool fruit or greenhouse, failing this a cold frame or a sheltered position in the open. Cover with pieces of board or glass, and keep the frost away until the young growths appear, then thoroughly harden, exposing as much as possible, and encouraging a sturdy growth. The planting out may be done as soon as the weather will permit.

These sowings should be repeated once a fortnight for six weeks, after which the seed can be sown outside. To produce exhibition pods, it is necessary to thoroughly prepare the ground. Trenches should be taken out in the same way as for Celery, three feet apart, eighteen inches deep and the same in width.

Thoroughly break up the bottom with a steel fork and add ten inches of good rotten manure, which should be covered with some of the finest soil taken from the trenches, and make the surface neat and fine.

When ready for planting lift the plants carefully with a trowel, having a double line in each trench, ten inches apart and eight inches from plant to plant. Dust with soot and sprinkle with fine cinder ashes round the plants. When they are tall enough, with sufficient bloom showing, the tops can be picked out.

Good soakings of liquid manure should be given when the pods are well set, and if exceptional pods are required examine the best plants and mark the most promising with a piece of bast. Remove the smaller pods and leave about six of the best on the plant.

It is a good plan to stake separately, thus encouraging the pods to grow straight and prevent wind from blowing them about. A good mulching of manure will be of much assistance in dry weather. When staging for exhibition they are best arranged all one way on a dish. Pick them the evening previous to the show as they will last better if left on the plant than if picked a few days before and put into water, unless in a too forward condition. Leviathan is preferable to any other variety, and Green Long-pod is good.

KIDNEY OR FRENCH BEANS.

The first sowing should be made under glass in pots or in a heated brick pit, the former being pre-

ferable in a good rich compost, using eight- or ten-inch well-drained pots. Fill them half-full with soil, select the finest Beans and sow five in a pot, four round the edge and one in the middle. Cover to the depth of one inch and place in a gentle heat.

When the plants are level with the top of the pot, fill up with a mixture of good porous loam and old Mushroom bed manure. Stop the plants and place them on a shelf near the glass, and syringe twice a day to keep down red spider.

As the young pods become visible admit air on all favourable occasions and give manure water at every other watering.

For planting in the open, sowings should be made about the 10th of April in pots or boxes under glass. Encourage a sturdy growth and gradually harden the plants off before they are transferred to their permanent quarters choosing a warm position under a south wall if possible.

Plant in rows two feet apart and ten inches from plant to plant. Draw the soil up to the seed leaf and eventually top dress with old Mushroom bed manure. Dust the plants with soot, wood ashes and lime to prevent slugs attacking them.

About the 25th of April will be soon enough for making a sowing in the open, choosing a sheltered border and land that has been trenched and manured and pointed over with a fork before sowing.

The stronger growing varieties should be in rows three feet apart, and six inches from plant to plant.

CLIMBING OR RUNNER BEANS 155

Sow the seed in double lines, cover it two inches deep and remove every alternate plant when the seedlings are above the ground. Sow once a fortnight to maintain a constant supply, the last one not later than the end of July on a south border. Pods for exhibition should be clean, straight, of a good pale green colour, and crisp. No variety surpasses Canadian Wonder when a good strain is obtained. Another variety that can be recommended is Ne Plus Ultra. French Beans are invaluable when shown at their best at spring and summer exhibitions, and their quality and appearance are much improved when grown under glass in cool houses or pits.

CLIMBING OR RUNNER BEANS.

This vegetable is indispensable for shows during August and September as it forms a distinct and telling dish in all collections. Enormous improvements have been made in this Bean during recent years, and every effort should be made to procure the best strains and cultivate them well, when pods from ten inches to a foot in length will be produced.

As the Bean roots deeply a trench should be taken out two feet in width and the same in depth and filled to within six inches of the top with good half-rotten farm-yard manure. Leave the soil in this state until sowing time, or planting of the earliest, raised under glass, a plan strongly recommended.

The first sowing outside should be made the first

week in May. Place three inches of the soil taken from the trenches on the manure and break it up finely. Sow two rows of the best selected Beans in each trench, allowing a distance of eight inches between each seed and ten inches between the lines. Cover the seed two inches deep with soil and rake down neatly.

Sometimes slugs are troublesome, and a sure preventive is to place a ridge of cinder ashes on each side of the rows, and when the young plants make their appearance, dust them over with lime and soot in equal proportions in early morning.

Staking.—Procure long stout sticks similar to those used for tall Peas and thrust them well into the ground to prevent the wind blowing them about. At every ten yards, drive two poles, one on each side of the row, well into the ground and also two at each end of the row ; the height should be at least nine feet. Ten inches from the top stretch stout tar cord along from pole to pole.

When the growth has reached the top of the poles nip off with a pair of shears as this encourages the plants to break and bear freely.

Give a good heavy mulching of half-rotten manure and water copiously in dry weather.

When pods are required for exhibition the rows should be well looked over, and the most promising pods discovered. Then thin the bunch to two, and pinch out the young points. Apply a slight dressing of some trustworthy artificial manure and syringe in the evening in hot dry weather.

The best variety is Best of All, the pods being handsome, produced very freely and of excellent flavour. Neal's Ne Plus Ultra, Scarlet Emperor and Prizewinner, if carefully selected, are also very good.

BEETROOT.

Though not such an important vegetable as many others for exhibition, every exhibitor of vegetables should be prepared with a good dish or two. It should be included in all large collections, but not in any containing less than ten. To obtain first-class specimens a deep light loam is necessary, and the Beet should be grown on land previously occupied by Celery, and no manure used when preparing the ground for this crop. As soon as the Celery has been cleared off commence to trench, giving a dressing of old mortar rubbish, road scrapings and wood ashes. The practice of boring holes as advised for Carrots also holds good in this case, whatever soil one may have to deal with. Bore the holes four feet deep, fifteen inches apart, and eighteen inches between the rows, filling in firmly with old potting soil, road scrapings, old hot-bed manure, well decayed leaf soil, mortar rubbish, and wood ashes, passing the whole through a quarter-inch mesh sieve. Place four or five seeds in the centre about two inches below the surface. In the early morning dust with soot and wood ashes occasionally, and keep the Dutch hoe busy between the plants when they appear to be making headway. Thin out as advised in other instances, and

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three or four times in the earlier part of the growing season a slight dressing of a good artificial manure may be given, choosing a showery day for the purpose. At the first sign of frost lift the roots, twist off a few of the outer leaves, and store the crop in a cool position, from which frost is excluded, in finely sifted road sand. For exhibition they should be of medium size, evenly tapering, regular, with a clean skin, and about twelve inches to fifteen inches long. Soak for half an hour in cold water, then sponge carefully, and remove any small rootlets with a sharp knife. The young fresh leaves should be left on, and the roots syringed just before leaving them to be judged. Good long-rooted varieties are Dobbie's New Purple, Pragnell's Exhibition, Sutton's Black and Sutton's Dark Red. For early use Carter's Crimson Globe and Sutton's Globe are good. These should be sown about 20th April in rows one foot apart, and the plants thinned out to ten inches between each. A good soil for this crop is that described in the first instance, and the best situation a south border.

BRUSSELS SPROUTS.

For late autumn shows a good dish of Brussels Sprouts forms a pleasing and telling feature in all collections of vegetables where eight varieties and more are required. Undoubtedly the best soil for Brussels Sprouts is a good heavy loam, but properly prepared almost any land is suitable. As a long season of growth

is required the ground should be deeply trenched in winter and a heavy dressing of farmyard manure incorporated, leaving the surface rough until spring, when as open a position as possible should be chosen. Sow the seeds thinly in pans or boxes under glass at the end of February or early in March. As soon as possible prick out the seedlings into boxes three inches apart, and later on transfer to a border outside in a sheltered position. After the first pricking off damp over and shade for a few days, and never allow the plants to suffer for want of water. Gradually harden off, and when they are about six inches high put out into their permanent quarters. Then the ground should be broken up and levelled. Lift with a good ball of soil, which should be made firm round each one when planted. Give each plant plenty of room, as nothing is gained by overcrowding ; three feet should be allowed between the rows and two feet six inches from plant to plant, and water freely with clear water. The draw hoe must be frequently used, and copious supplies of sewage water given in hot, dry weather. For later supplies a second sowing should be made about April 10th. By the end of September place a stick against the most promising plants for identification, also stake the selected ones to keep them upright. Every ten days a teaspoonful of a good artificial manure should be washed down to the roots of the selected plants. When Brussel Sprouts are exhibited on their stems three is generally the number. These stems should have clean, firm buttons from top to bottom.

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Remove the large under-leaves, also any decaying ones from the buttons. Syringe the stems and roots with clear water, and fix them in small pots for staging. Where the detached Sprouts only are exhibited, fifty is generally the number. Take them off with a knife, leaving a small part of the stem to assist in handling them. Splendid exhibition varieties are Sutton's Dwarf Gem and Cambridge Champion. A common mistake in exhibiting these is that the buttons are generally staged much too large ; they should be of medium size, quite firm, and with a perfectly smooth surface.

CABBAGES.

Though one of the most useful vegetables cultivated in the kitchen garden, the Cabbage can hardly be called a high-class one for exhibition, but when shown heads of medium size, fresh and unblemished should be selected. A mistake very often made is to sow the seed too soon for the spring supply, consequently a large percentage of plants instead of turning in run to seed.

The 25th of July will be soon enough to make a sowing in an open part of the garden, which should not be manured previous to sowing. Scatter the seed broadcast and before raking it, strew over the bed a mixture of finely sifted old lime rubbish and wood ashes, as this is a safeguard against insect pests.

Securely net the bed against birds. This sowing, if possible, should be made on a south border or in some

sheltered position, and the plants are not particular as to soil if it has been well manured and deeply trenched. Plant eighteen inches between the rows and one foot from plant to plant, so that in spring every other one may be taken out. These are often useful for filling up, especially after a hard winter, thus leaving the plants two feet asunder.

For this sowing Ellam's Early is a trustworthy variety, seldom running to seed, turning in quickly, and is of excellent flavour. Make a second sowing about August 16th in a sheltered position, and plant the seedlings when large enough in an open part of the garden.

It is a good plan to put them on ground previously cropped with Onions, as this will have been deeply trenched and manured, and will therefore only require another dressing of farmyard manure or some good artificial like ichthemic guano, which is especially good for this crop, and deeply dug in.

Plant as advised before and keep the ground well stirred with the hoe.

Ellam's Early, Enfield Market, Sutton's April, Daniel's Little Queen and Flower of Spring are good for this sowing.

Any that show a tendency to clubbing should be thrown away and replaced from the seed bed. About the middle of November earth up the stems, to keep them safe for winter, and at the end of March bring the draw hoe into use and stir the soil up thoroughly.

About a teaspoonful of nitrate of soda to each plant will prove very beneficial.

Make two more sowings in June, one on the 10th and another about the 20th, in an open part of the garden. Plant out on deeply dug heavily manured ground ; these will be for autumn and winter supplies.

The varieties recommended are Rosette Colewort and Hardy London Green ; these give small and delicious heads, and one foot apart all ways will be sufficient.

Pickling Cabbages.—Make a sowing of these about the 15th of August, prick out in a sheltered position four inches each way to winter, and in the spring plant two feet apart each way in an open position. Dwarf Blood Red is the best.

CARDOONS.

Although Cardoons have never become popular, they have been more largely cultivated during recent years, and when well grown are very acceptable at the table.

They are only seen in large collections, and although something like Globe Artichokes in appearance, require quite a different method of cultivation.

Take out trenches two feet deep and twenty inches wide, and break up the bottom soil—the trenches should not be less than five feet apart—and place some well-decayed horse manure in them, almost level with the top, and cover with two inches of soil.

Sow the seed the first week in May, not before, otherwise many of the seedlings will probably run to

flower. Dibble the seed in twenty inches apart, with three or four in a hole, and cover over with an inch and a half of fine soil. Thin the seedlings to one at a place when large enough, and use the strongest plants for making good any failures.

Keep the plants well supplied with water during the growing season, and give farmyard manure water once a week. Watering overhead is a good practice in hot and dry weather, and produces what is most essential, *viz.*, a quick growth.

Blanching of Cardoons must commence ten weeks before they are wanted, and be continued at intervals of ten days until the process is complete, stiff brown paper and hay-bands being the best material for the purpose. Put the paper about eight inches up the plant for a start, then bind round a hay-band, and secure each plant to a stout stake. Bank soil up to the same height, and continue this until the blanching is completed.

Cardoons are useful during October and November to the exhibitor of large collections of vegetables, if the stems are blanched about two feet.

CARROTS.

Select a deep sandy loam for this crop, although capital roots are often grown on sandy peat, but seldom indeed can exhibition specimens of the finest type be produced unless special means are taken to procure them. Few things are more attractive when at their best than Carrots at any season of the year, consequently

the additional trouble incurred to secure them is time well spent. For early shows the seed must be sown under glass during January or February, or, better still, one sowing at the beginning of each month. A brick pit with sufficient hot-water piping to counteract frost is a distinct advantage, and failing this substitute a hot-bed of leaves. There must be no undue hurry in placing the prepared material in the frames, for should this become overheated the chances of good clean Carrots are remote. Sufficient warmth should be maintained to create a growing temperature. Get together a compost embracing the following ingredients, or as much like them as possible : Old potting soil, road grit, old mortar rubbish, peat, well-decayed leaf soil, and light sandy loam which has been stacked for some time. Mix in equal proportions, and to every fifteen barrow loads of the mixture add one of wood ashes and half a bushel of bone-meal or Clay's Fertilizer, passing the whole which should be prepared some days beforehand and thoroughly incorporated through a quarter-inch-mesh sieve. In the bottom of the pit place a layer of three inches of old Mushroom bed material, covering this with the compost to the depth of eighteen inches or two feet. Three good varieties for these sowings are New Scarlet Intermediate, Champion Scarlet Horn and Veitch's Model. On fine days the sowings should be syringed, shutting up the structure early in the afternoon. Thin out as soon as the seedlings are large enough to handle, only partially at first, but later on thin out to three inches apart ; ventilate

freely as they get established, ultimately entirely removing the lights. Young Carrots may be pulled from time to time for immediate use, thus allowing those intended for exhibition space to develop properly. For autumn and winter shows the second week in April is a suitable time to make a sowing. No manure should be added to the ground, which should be thoroughly trenched during winter, and unless soil is available similar to that first named boring holes must be resorted to and filled with a mixture similar to that previously described. So certain is one of obtaining a large percentage of typical roots that we would strongly advise every one to practise this plan if only a row or two be done. The holes should be bored with an iron bar to the depth of three feet four inches, and allow a distance of thirteen inches from plant to plant. The rows should be eighteen inches apart. Use the mixture in all cases moderately dry, and ram it firmly with a stick. Place about six seeds, which should be just covered, in each hole, and neatly rake over the soil. Thin out the resulting seedlings, leaving three of the most promising for a week or ten days, after which thin to one, leaving, of course, the strongest and healthiest plant as close as possible to the centre of the hole. Dust the growths in early morning with fresh soot once a week. Green fly is often very troublesome in the young stages of growth, but this may be easily got rid of by a timely application of strong soft soap and water, which should be distributed with a syringe. Keep the hoe constantly plied be-

tween the plants when the growth is of fair size. Mulch the whole of the ground with old Mushroom bed manure to the depth of one inch, and during spells of dry weather occasionally water the crop thoroughly. The whole of the crop should be carefully lifted when the growth is completed, otherwise many of the best roots will split. The best exhibition specimens are quite clean, of moderate size, symmetrical in form, and of a good dark red colour. Trim off all small root-lets with a sharp knife, partly reduce the tops, and store in a cool shed or cellar in fine sand, placing the roots in an upright position. When preparing them the day previous to the exhibition, soak the specimens for about an hour, clean them with a soft sponge, and thoroughly rinse in clear water. Cracked specimens, those attacked by wire-worm or having green tops should be rejected. For all autumn and late shows there is no variety, in my opinion, to beat a true type of the New Red Intermediate, but, at the same time, when first-class specimens of Long Surrey can be had, this is a very close rival.

CAULIFLOWERS.

Cauliflowers when well shown form an attractive and valuable feature of all vegetable competitions. No matter what the season of the year may be and the size of the collections, neither Cauliflowers nor Broccoli must be excluded, but, whenever possible, of the two give the preference to the Cauliflower. Con-

sequently, strenuous efforts should be made to get medium-sized, close, pearly white heads in the freshest possible condition, and to obtain these make frequent small sowings of suitable varieties. Liberal culture is necessary. For early supplies in the spring the sowings should be made in the autumn, one during the first week in September and another about the 25th of the month, on a south border in the open. The seed should be sown thinly in beds as advised for other sowings of the Brassica tribe and securely netted. When large enough to handle, prick the seedlings out in cold frames four inches apart each way in soil not over rich, otherwise too much growth will be made. Give air freely on all favourable occasions, but never allow the plants to become dust dry. In severe weather protect the lights with some covering material. Two good varieties for this sowing are Walcheren, an old favourite, but still good, and Magnum Bonum. Many of the latter will become blind from this sowing after they are planted out, but it is important to grow this variety, as it produces heads of the finest quality after the Walcheren and when Cauliflowers are scarce. It is a good practice to plant for this crop just as thick again as required ; then a good supply is ensured. For the main crop plantations should be made at the end of March or the beginning of April, putting out the best plants on a south border, two feet six inches between the rows and two feet from plant to plant. Lift with a good ball of soil and plant with a trowel. To prolong the supply, plant a batch in an open situa-

tion and a third on a north border. Early in February and again in March sowings should be made for later supplies, growing on freely and planting out as soon as hardened off. Make a sowing about April 10th for late autumn use, suitable varieties being Magnum Bonum, Early Giant and Autumn Giant. When planting out the rows should be three feet apart, with a distance of two feet from plant to plant. Almost any soil will grow Cauliflowers when it is thoroughly trenched and well manured. This crop revels in copious supplies of liquid manure, and, if good heads are wished for, this generous treatment is most essential. Hoe constantly all through the growing season to keep weeds in check ; this also contributes towards successful culture. Cauliflowers may be kept in fresh and good condition for at least a fortnight if lifted before they are fully developed and hung up head downwards in a cellar or some other cool place. A common mistake in exhibiting Cauliflowers in the majority of cases is that they are staged too large, and why judges so often favour these it is difficult to understand.

CELERY.

Celery is frequently not so well shown on the exhibition stage as it should be, but when well-grown specimens free from blemishes are staged it is highly attractive and shows the skill of the cultivator. Some object to large specimens, but this is a mistake, providing of course they are solid, and when cut with a

knife the heart is close to the root. Two sowings of seed at least should be made, the first not later than the middle of February, and the second in the first week in March. Soil of a moderately light texture should be used, but not rich ; a mixture of half leaf soil and half light loam finely sifted, with a moderate addition of either road or coarse silver sand, forming a suitable compost.

The pots or pans should be well drained. Raise the seedlings in a gentle heat, taking care that at no stage of growth any check whatever is experienced, the most serious of all being an absence of moisture at the roots, especially when in the seed pans. When this is the case a large proportion frequently run prematurely to seed. When the seedlings are large enough to handle prick them off three inches apart in boxes, using a light sandy soil. Return the boxes to a gentle heat, gradually hardening the seedlings off as they get established before planting out. This applies to the first sowing. From the second sowing the seedlings may be pricked out in any warm sheltered part of the garden where a rough framework can be placed round them for protection. Shade from hot sun and give shelter from cold drying winds for a time, also covering them up in some way during cold nights. A large number of varieties are in commerce, many of which are excellent and many practically worthless, either for exhibition or home consumption. Repeated trials have been made on a large scale of most of the known kinds and the conclusion arrived at is that the

This is most beneficial and promotes a quick and free growth. Lift the specimens the day before they are wanted, removing only the worst of the outside leaves and washing off all dirt. Stand them head downwards and give a thorough syringing with clean water. Finally reverse their position and give the last rinsing. It is usual to stage either three or six sticks, arranging them in triangular fashion. At the last moment, when staging, trim off the bottom with a sharp knife, and wipe the sticks with a damp clean sponge. Slightly spray them over and keep covered with white paper.

CUCUMBERS.

At most exhibitions of any extent prizes are offered for a brace of Cucumbers, but as a rule a very large percentage are anything but what they should be, and they are usually staged too large. An ideal brace of Cucumbers should be as near alike as possible, quite short handles, the same size in circumference throughout, no marks of handling should be seen on them, and the flower retained at the ends. Trustworthy varieties of quick growth are essential. Ten days after the fruits are in flower during spring and summer should be sufficiently long for development. The fruits and foliage should not be syringed but a strong heat and moist atmosphere maintained.

For spring and summer supplies begin sowing at the end of January and again in February and March in small sixty-sized pots, placing one seed in each and

water in with warm water. Plunge the pots in a gentle bottom heat until the young growth appears, then place them near the glass in a temperature ranging from 60° to 70° and not below 60° at night. As the rough leaves appear pot on into four-inch pots, warming the soil and placing it about the roots carefully. Plant in the prepared bed when these pots become filled with roots, and great care must be taken that the plants are not exposed to any chill from cold draughts or by applying cold water to the roots or foliage.

A suitable compost for this planting will be the soil cut from an old pasture the previous autumn. Chop up as small as hen's eggs, and if at all heavy mix with it some well-decayed leaf soil, old spent Mushroom bed, road scrapings and old mortar rubble. Place on the bed and make moderately firm.

Pinch out the point of the growth after it has reached the first wire, and do not shade at all as Cucumbers like plenty of sun, and admit very little air at any time. Never allow the roots to become dry or the fruits will be useless. When the plants are in full bearing give manure water at every other watering, also a top dressing once a fortnight of loam and well-rotted manure, with a sprinkling occasionally of a good artificial manure. Liquid manure water poured on the floor at night will greatly benefit the plants. Look over them two or three times a week, remove decaying leaves and badly shaped fruits, and regulate the growths.

Fumigate at once if any insect life appears, and for mildew keep the house dry and dust with black sulphur.

For maintaining a supply during the winter, sufficient artificial heat and a lean-to or three-quarter-span house are necessary. All should be ready by the last week in October, by preparing a good sweet fermenting material, and the soil should consist of two parts good fibrous loam and two of leaf soil passed through an inch sieve. Add a peck each of coarse road grit and finely broken charcoal to every barrow load.

The seed should have been sown about October the first and potted on as before. By the first of November the plants should be strong enough to plant out. Give all the light possible by keeping the glass clean, keep the paths well damped down ; except on bright days very little syringing will be needed. Fumigate and dust with sulphur as advised before.

Frame Culture.—When planted in frames the plants should be near the glass and the fermenting material will supply the warmth. This should consist of fresh leaves and long stable litter in equal proportions. Well mix and turn every day for a fortnight before making up the hot-bed material, and after the frames have been placed thereon and a gentle heat is assured, place the compost along in a ridge and peg down the plants after planting. Ventilate in the morning, syringe and shut up early in the afternoon. Keep the growths well regulated and do not allow the fruits to stop on the plants after they are fit for cutting.

Should any sign of distress show, top dress with loam and well-rotted manure and dust the surface occasionally with Clay's or ichthemic guano. Mr. Beckett says : "I have paid a good deal of attention trying to improve existing varieties with the result that the variety I raised and now being sent out under the name of Ideal is to my mind the most useful and perfect Cucumber I have grown. Lockie's Perfection is also a splendid variety for winter use, but hardly long enough."

LEEKs.

It must not be assumed that the magnificent specimens sometimes staged are brought to such perfection without a considerable amount of trouble and forethought ; indeed, few vegetables cultivated for exhibition require more attention to bring them to such a high standard of excellence. For some reason or another, our northern friends generally excel in their culture, this being no doubt due to their better knowledge of the Leek's requirements, but at the same time when valuable prizes are offered in open competition the southern growers of late years have not been far behind, and in one or two notable instances have proved victorious.

Leeks are generally shown six together, and these should be as alike both in length of blanched stem and circumference as it is possible to get them. The blanched part should be of the same thickness throughout, with no sign of bulbing at the bottom. Many

growers attach too much importance to the length the Leek is blanched. This is a mistake, as it does not denote any special culture. A fair length is from fifteen inches to eighteen inches, and each should measure from eight inches to nine inches round. Reject any that show the slightest indication to throw a flower spike. All the rootlets and flag should be left on, and the blanched part be as white as is possible to get it. For early shows make the first sowing of seed early in January in a compost similar to that advised for Onions. In this case it is better to sow the seed in well-drained three-inch pots, the soil being made only moderately firm. Place a few seeds in the centre of the pots, cover to the depth of about half an inch, and thoroughly water in. Place the pots in a gentle heat, from 50° to 55° , keeping them near the glass, and carefully avoid overwatering. Remove all except the strongest and most vigorous plant in each pot, while frequent dampings overhead are very beneficial at this stage of their culture. Immediately the pots are well filled with roots, shift on into six-inch pots, adding a six-inch potful of bone-meal to every half bushel of compost made up in the first instance. Pot fairly deep and press the soil lightly about the roots. Grow on in a genial temperature, and shorten back the tips of the leaves once a fortnight. Gradually harden off in a cold frame, and by the middle of April they should be ready for planting out.

The trenches should be eighteen inches wide, two feet deep, and the bottom well broken up with a fork.

On this place four inches of half-rotted cow manure, filling up the remainder of the trench with a mixture of good fibrous loam, leaf soil, old Mushroom bed manure and road scrapings in equal parts, with a free sprinkling of finely sifted mortar rubbish and bone-meal. This will make an ideal mixture for them. Put out the plants fifteen inches apart in single lines, disturbing the roots as little as possible and pressing the soil only moderately firm. Give a good watering afterwards, and if the weather is rough and stormy shelter must be provided. Damp over frequently in dry weather, and do everything possible to give the plants a good start.

Unlike Celery and most other things which require blanching, the Leek must be drawn up and blanched in its early stages of growth, as it is quite impossible to do so with any success after the growth is made. Ten days after planting commence the operation and use brown paper collars or stiff brown paper, the former for preference. They can generally be purchased at a cheap rate from the various seed houses. A small stick should be placed on each side of the collars to prevent their blowing about. Water freely once a week, and apply a small quantity of some good artificial manure, say, about a dessertspoonful to each plant.

As the heart appears above the paper collar this may be drawn up until the desired height is reached, placing a little fine soil round the base of the plant. A month later zinc collars nine inches long, and sufficiently large to avoid injuring the plant, and soldered

together, should be placed over the paper collars, and these secured in position by a small quantity of earth. Later on add similar pieces of zinc, placing them on the top of the first one and adding more soil. Keep the plants well watered still, and at every third application apply liquid manure. Gradually earth up until the top of the zinc collar is almost reached, but extreme care should be taken that not even the slightest particle of soil finds its way to the heart of the plant or this will wash down and do much to mar the appearance of the specimens. When lifting Leeks, first carefully remove the soil with a spade, so that they are not bruised or injured. Withdraw the pieces of zinc by holding the leaves with one hand and drawing the cylinders over the top with the other. Then lift with a fork with as many roots as possible. Tie the foliage in two or three places with raffia to prevent the leaves splitting, and wash thoroughly, carefully removing only the outer skins. Let them drain head downwards and keep covered with a clean linen cloth until ready for packing. Tie a narrow piece of white tape round at the top of the blanched part, when they should be carefully wrapped up in soft white paper. Leeks are presented on the exhibition stage in many ways, but they are best on a black varnished board and in an almost upright position.

ONIONS.

Few vegetables, especially from an exhibition point of view, have been more improved during the last

few years than the Onion. It now forms one of the most important and interesting subjects at all our vegetable exhibitions, and no collection of vegetables at any season of the year is complete unless a dish is included. Consequently all interested in the production of high-class vegetables must endeavour to produce the finest specimens. Fortunately Onions are not fastidious as to soil or position. Any one with a garden and who is prepared to take the necessary trouble can excel in their culture.

Preparation of the land is unquestionably the first and most important part of Onion culture, and without it first-class specimens are impossible. Select an open sunny position for the site, bearing in mind that, unlike most other crops, it is not at all necessary to change the ground, but on the contrary, as far as Mr. Beckett's experience goes, better results will be got by utilising the same ground annually. Mr. Beckett writes: "The best bulbs I have yet produced were those of 1901 on ground upon which our large Onions had been grown for the last seventeen years. The ground must be thoroughly trenched to the depth of at least three feet, the subsoil well broken up, and the bottom spit brought to the surface each year. I regard this as of the utmost importance. The time at which the trenching should take place depends on the soil one has to deal with. A light soil should be so treated as early in the autumn as circumstances will permit, but that of a stiff retentive nature will be better left alone until February."

It is quite safe to say that hardly too much farm-yard manure can be given when trenching. The longest should be placed quite at the bottom of the trench, and the shorter and more decayed in the centre. In the course of trenching, no matter at what season, always leave the surface rough so that as much of the soil as possible will receive the full benefit of the weather. Immediately it is finished apply a good dressing of soot, and in the case of stiff wet soil strew the surface with fine mortar rubbish, road grit and burnt garden refuse, all of which will prove beneficial. It may be thus left until the early days of April. It should then be forked over to the depth of eight inches and made very fine—choosing good weather for the purpose—when another dressing of soot and some approved patent manure should be given. Afterwards rake over, leaving the surface quite fine and level.

The beds should be marked out ten feet in width, allowing a good broad alley, sufficiently wide to walk between comfortably for watering and giving the necessary attention. Mark out the rows about fifteen inches apart, and allow a distance of one foot from plant to plant. The plants should have been brought forward properly hardened off and ready for transplanting to their permanent positions as early in the month of April as the weather will permit ; lift with a garden trowel, plant firmly, and always use light boards for walking on.

Raising Summer Onions.—It is first of all important to get a trustworthy strain, for without it success is

impossible, and to secure this end it is well always to save one's own seed from a few selected bulbs. Mr. Beckett writes: "I do not for one moment wish to infer that good seed cannot be purchased, as many of our leading seedsmen take great care to select stocks, and good results frequently follow, but my contention is that a bird in the hand is worth two or three in the bush.

"With regard to the variety, I know nothing to compare with Ailsa Craig, and my opinion is that when at its best it represents a typical Onion, which will be for many years hard to beat. The seed should be sown for all southern districts early in January, and for the more northern parts at the end of the month or early in February in boxes two feet long, one foot wide, and four and a half inches deep. Give proper drainage and cover it with pieces of fibrous loam."

A suitable compost will consist of two parts good fibrous loam, one part spent Mushroom bed material, one part well-decayed leaf soil, adding to these ingredients sufficient coarse sand to keep the whole porous. This should be well mixed and passed through a quarter-inch-mesh sieve, afterwards filling the boxes to within half an inch of the top. Make the compost thoroughly firm, when the seed may be sown thinly. Add sufficient soil just to cover the seed, which should be pressed down firmly with a piece of board and well watered in with a fine rose. The most suitable place for raising the plants is an early vinery or peach house just started, but a light position in the greenhouse will also answer,

or, failing this, a frame or pit ; over-forcing must be guarded against at all stages of the growth under glass. Immediately the young plants can be safely handled transfer them to other boxes, using the same kind of mixture, with the addition of a six-inch potful of bone-meal to every bushel. Use a small-pointed stick for lifting the seedlings, and dibble them in three inches apart, making them quite firm. Carry out this operation in the same temperature in which they are growing, as a check at this stage will have serious effects. Maintain a temperature of 55° to 60° , according to the weather, place near the glass, syringe frequently, and shade for a few days in bright weather, encouraging a sturdy growth in every way. After the plants have made a good start transfer them to a pit near the glass, syringe morning and afternoon, and ventilate freely whenever the weather is suitable. Finally, harden off in cold frames before planting out, and by this time the lights may be entirely removed, except in rough and stormy weather.

Management in the Open.—As mentioned before, the Onions should be ready for planting out early in April, the soil being made very firm about the base and thoroughly watered. Until established the newly planted Onions receive much benefit by careful syringing for a few weeks several times during the day in bright weather. Stir the surface slightly between the rows with a Dutch hoe, and afterwards give a good mulching of sifted horse manure to the depth of two inches. About every ten days apply a dusting of soot

and also a good patent manure, choosing showery weather as far as possible, and the best part of the day is late afternoon.

The Onion fly is sometimes troublesome, but chiefly affects plants raised outside ; it is, however, always well to have a few plants in three-inch pots to make good any failures, or the appearance of the bed will be spoilt. Mildew should be dealt with immediately it is seen. Cut off, remove and burn every affected piece, and to prevent the disease from spreading dust thoroughly with slaked lime and black sulphur frequently. Keep the beds free from weeds, and in dry weather give thorough soakings of water, while at every other watering drainings from the farmyard will prove of much assistance. This may be continued until about the middle of August when growth should be practically completed. Complaints are frequent about the keeping qualities of these large specimens. When allowed to remain too long on the ground and roughly handled during lifting they decay quickly. They must not be bruised. When harvested early and carefully handled complaints should be few about premature decay. In the first place, lift partially with a small hand fork all the most shapely and promising bulbs, as this assists ripening and prevents splitting in wet weather. Many of the finest specimens are spoilt through neglect of this. Select a fine day for lifting the crop. In finishing the ripening off it is imperative to keep the bulbs dry, and for this purpose place them in boxes to hold about a dozen, and half fill the boxes

with wood wool for them to rest upon. By so doing advantage may be taken of sunny weather to expose them, placing them safely under cover at night. A cool airy vinery or even cold frames are suitable places on wet days, turning the bulbs daily, so that every part is thoroughly exposed and ripened. Finally, clean them by removing all loose skins, paring off the roots neatly, and shortening the tops, leaving about six inches, which should be neatly bent over and tied with fine twine. Store in a cool dry airy room, and allow them to rest on a bed of soft wood wool.

Autumn Varieties.—Prepare ground for this crop in the same way as for the former. Make two sowings, the first about 20th August, and another ten days later, choosing a southern site for the latter sowing. Before sowing give the bed a good dressing of soot and wood ashes, and sow thinly in shallow drills nine inches apart. Make thoroughly firm, rake down fine and level, hoe frequently to keep down weeds, and little further attention will be needed before spring. Being practically hardy the earlier the plants are transplanted to the prepared ground the better. Lift the strongest and best plants with a garden trowel, plant with the same, and treat exactly as advised for the summer crop. Autumn-sown Onions are indispensable for spring and summer shows, and when well grown and staged stand one in good stead in close competition in a collection of vegetables. No attempt should be made to ripen these off except for late shows, and to be seen at their best they should be faced up and neatly garnished

with Parsley. One of the best varieties for this purpose is White Leviathan, but it is not a good keeper. Other good varieties are Blood Red and Lemon Rocca.

PARSNIPS.

When clean roots free from blemish, of moderate length, and tapering regularly to a point, are staged at the autumn shows, they are undoubtedly both attractive and serviceable. To ensure exhibition roots, holes must be bored the same as advised for Carrots and filled in with a compost consisting of loam, road grit and well-decayed leaf soil in equal proportions, and to every barrow load add one peck of wood ashes. The whole should be thoroughly mixed and passed through a sieve as in other instances.

The holes should be bored five feet deep with a space of twenty inches between each while the distance between the rows should be two feet. Fill the holes with the prepared compost and press firmly with a stick, and when ready to sow the seed make a hole in the centre of the compost to the depth of an inch and a half, placing four or five seeds in each. Cover with fine road sand and when the seedlings are large enough thin out, leaving the strongest plant in the centre. Dust the plants once a week with soot and keep the Dutch hoe constantly at work. When Parsnips are required for exhibition lift them carefully the day before the show, cut off any small rootlets and clean in the same way as advised for Carrots. Six specimens

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are generally staged, all of which should be alike and arranged neatly on a bed of Parsley, placing them as follows: three at the bottom, two next, and one on the top.

Parsnips lose colour and freshness after they have been shown once, therefore prepare fresh roots for each exhibition. The Student, Hollow Crown and Tender and True are all trustworthy varieties.

PEAS.

Exhibition pods of the highest excellence can only be obtained when the best known methods of culture are practised. Unquestionably the most important of all is the preparation of the land. Fortunately Peas, like many other vegetables, are not over fastidious as to the soil, provided, of course, it is brought under a proper system of cultivation. Deep tillage is important, and it is surprising to what a depth the roots will penetrate in search of food and moisture during hot and dry weather, providing, of course, the soil is in a favourable condition. The land should be thoroughly trenched to the depth of three feet six inches during winter and given heavy dressings of manure. That which is quite green from the farm-yard should be placed at the bottom, and in the centre of the work that in a more advanced state of decomposition. On stiff retentive land anything with a tendency to render it more porous should be worked in, for instance, such as burnt garden refuse, mortar

rubble, and road scrapings, and immediately the trenching is finished a small surface dressing of soot and lime in equal proportions should be applied. The land should then be in splendid condition for receiving the seeds or plants when the season comes round. As a rule it is fairly easy to get good dishes of Peas during June and the early part of July, but after that date, except in the northern districts, they are more difficult to obtain. At the same time it is practically useless to put up a collection of vegetables unless these are included, so that strenuous efforts should be made to obtain them, and deep trenches should be prepared for these late additions in the same way as for Celery. Select suitable varieties, sow the seed thinly at the proper dates, and have the roots well under control; the trenches are a means of supplying both liquid manure and clear water in sufficient quantities to maintain the plants in strong growth. A good mulching of half-decayed manure, however, should be placed about them. Mildew generally plays sad havoc with all the later sowings of Peas, this resulting from dryness at the root. For all early shows raising the plants in boxes and transplanting is preferable, and much better results are obtained in this way, providing, of course, the plants receive proper attention during their growth before planting out. In no case must the plants be forced, but encouraged to make a sturdy and quick growth, and be thoroughly hardened before placing in their open quarters. This plan has many advantages over sowing in the open.

The earlier sowings should be made under glass during February and March, using boxes two feet long, one foot wide, and four and a half inches deep, and make provision for good drainage.

The best compost consists of two parts good loam, one part rotten leaf soil, and one part spent Mushroom bed material. Well mix and cover the crocks with the rougher parts of the soil. The boxes should be three-parts filled and the compost made moderately firm. Sow the seed evenly all over, leaving them about one inch apart, and cover with half an inch of the finer soil, giving afterwards a thorough watering. A gentle heat is all that is required, a vinery or greenhouse answering admirably. As soon as the seedlings are well above the soil remove the boxes to a cold frame or other glass structure where a sturdy growth is possible. Gradually admit air, thus hardening them off until they can be placed out of doors in an open yet protected situation before planting. Make the first sowing towards the middle of February, continuing at intervals of a fortnight for succession. Each plant should be lifted with a small hand fork. Plant double lines, allowing three inches between the plants and four inches between the lines. Stake and protect the plants with nets at the same time, and give a dusting of fine cinder ashes as a check to slugs. If the weather be fine when planting water in freely. Later sowings should be made in the open and the seed dibbled in twice as thickly as it is required, thinning out when the plants are sufficiently advanced, and

staking at a later period. As soon as the third flower can be seen pinch out the points of the growths, remove the garden netting, and apply a good mulching of manure. All badly formed pods should be taken away and moderate thinning practised at all times.

The pods of exhibition Peas should be large, well filled, of a good colour, and free from rust, while the seeds should be of fair size, fresh, and of good colour, quality and appearance. For the first sowing outdoors commence the first week in April, while the last should not be made later than the first week in June. Rows of dwarf Peas should be six feet apart, and the taller kinds about eight feet.

For the earlier sowings choose Early Morn, a much improved form of Gradus, for mid-season varieties Duke of Albany, Quite Content, Alderman and Edwin Beckett, and for the latest sowings Autocrat. Other good late Peas are Ne Plus Ultra, The Gladstone and Masterpiece.

SAVOYS.

These are not important for exhibition but are often shown in large quantities as single dishes, and of course must be included in an unlimited collection. Of their value in winter one need not write, but the seed is often sown and the seedlings are planted out much too early to be of real service.

After the heads have been touched by frost, the flavour is much improved. As Savoys are seldom re-

quired before the winter months, they are of little value before then, as plenty of other green vegetables are generally available before them. Two sowings should always be made, the first with the usual winter greens and the second the first week in May. When the space at command is limited, Savoys may be well grown if planted between early Potatoes. They are not particular as to soil, and no manure need be used when the land is good. Put the plants in with a crow-bar, on ground previously occupied with Peas, Broad Beans or a similar crop, and digging is not required.

Allow twenty-two inches between the plants and two feet between the rows. Thoroughly water in and keep the ground well stirred with the hoe.

Plant the later sowings on deeply dug ground with a little manure worked in.

Carter's Giant Green, Sutton's Perfection and Drumhead are excellent, the latter perhaps a little coarse, but extremely valuable in severe weather on account of its hardiness. For small gardens Tom Thumb is a well-flavoured, desirable variety and should be always planted eighteen inches apart. Exhibition Savoys should be of medium size according to the variety, perfectly firm and as much alike as possible, both in size and in shape.

TOMATOES.

This useful vegetable or fruit, whichever one is pleased to call it, is entitled to a place in all collections

at any season of the year, and when presented in perfection forms a pleasing addition to the exhibit, but unquestionably the fruits must be faultless to obtain the maximum number of points, as they are easily produced when plenty of glass is at command compared with many other vegetables.

The first sowing of seed should be made early in January in a genial temperature and a light sandy compost. The seed will germinate quickly and when this has occurred place the seed pan without delay on a shelf near the glass.

As the third leaf is forming pot off singly into thumb pots using a compost of one part loam, three parts leaf mould, with a liberal quantity of silver sand and mix the whole well together.

Warm the soil to the same temperature as the house, and after potting thoroughly water in, while the water must be of the same temperature as the structure in which the plants are growing. Too much moisture both at the roots and overhead is a mistake.

The plants will subsequently require potting on into sixties, then into thirty-twos, and finally into the pots in which they are to fruit.

The soil for the final potting should consist of three parts loam, one part thoroughly rotten manure, with sufficient coarse sand or road grit to keep the whole porous. Crock the pots carefully and pot firmly.

The plants can either be trained to stout stakes

inserted in the pots or to a trellis near the glass, giving them all the light possible and encouraging a sturdy growth. The single stem method is preferable, and keep the lateral growths rubbed out.

To enable the plants to make satisfactory progress and the pollen to develop freely a buoyant atmosphere must be maintained. Examine the flowers about the middle of the day, slightly tapping the stems with a hazel twig to distribute the pollen to ensure a prolific crop. When the plants are well set with fruit, give manure water at every other watering, farmyard drainings being preferable. At the end of April or May ripe fruits may be expected.

For successional crops later sowings should be made during February, March and April and a cool house or brick pit will give splendid returns through the summer and early autumn if the plants are carefully tended and the same rule followed as for the earlier crop.

It is of great importance to make a careful selection of varieties, among the best being Sunrise, Best of All and Winter Beauty. These are red-skinned varieties of splendid form.

A good yellow-skinned variety is Golden Jubilee.

Perfect Tomatoes should be from medium to large in size, skins clear and unbroken, flesh ripe and solid, and the fruits carefully cut and laid on some soft material in a warm dry room after they are well coloured. For exhibition they never look better than when shown on clean cotton wool.

TURNIPS.

Small sowings should be made frequently from the beginning of March until the middle of September on land that has been deeply broken up and manured the previous season. The ground should first be raked down with a wooden rake, and afterwards with an iron one, leaving the surface well broken up and friable.

Whatever the ground is that has to be dealt with, make drills about an inch deeper than is considered necessary for the seed sowing, and into these place a compost of the old soil from the potting bench, with a peck each of soot, lime and wood ashes added to every barrow load. Mix the whole thoroughly and pass through a fine sieve. When the seed is sown cover it with the same material. It will be necessary to protect against birds, which are often very troublesome. Garden netting should be stretched over iron hoops, thus enabling the crop to be easily thinned. This must be done as early as possible. Copious supplies of water should be given in dry weather, also a dusting of wood ashes and artificial manure every week, and a dressing of soot once a fortnight. Perfect Turnips ought to be of medium size with small tap roots, clean skin and crisp and juicy flesh.

When preparing roots for exhibition soak them for half an hour and remove all dirt with a sponge, giving two or three more washings to make them quite clean.

For early shows sow seed on a south border of Early Red and White Milan about the middle of February. For later use Snowball and Jersey Lily are excellent, the latter being very handsome and of delicious flavour.

Turnips when in perfect condition frequently prove invaluable to the exhibitor of a collection of vegetables. They should always be included in a collection of twelve dishes, and often when eight or nine only are required. A valuable turnip for May shows is a greatly improved form of Jersey Navet named Carter's Forcing, which, if sown at intervals during March in cold frames, produces splendid roots of the best quality.

VEGETABLE MARROWS.

Vegetable Marrows are not so largely grown for early shows or for general use as they deserve to be. A good dish during May and June should carry great weight, and they may be produced in better condition under glass than from the open garden. A good type of Moore's Cream when at its best is hard to beat, and it is also very prolific. Pen-y-byd is very distinct and of excellent quality. Prince Albert is the best green variety. The seeds should be sown the first week in February singly in small sixty-sized pots in heat and again in the middle, and at the end of the same month ; place the pots in a light position as near the glass as possible to encourage a sturdy growth, and

when ready pot on into thirty-two-sized pots in a porous soil and support each plant with a stake. For the earliest cutting a few should be grown in ten-inch pots in a temperature not exceeding 70° with sun heat, and trained up to the lightest position in the house. Very little bottom heat will be required. Stop the principal growths and fertilise in the same way as for Melons.

For frame culture prepare a mild hot-bed composed chiefly of leaves on which the frames should be placed.

As the heat is on the decline place the soil consisting of loam, leaf soil and road scrapings in the frame, and leave space for top dressing, warm the soil and turn out the plants carefully. Give air freely on all favourable occasions, but avoid cutting winds and shut up early in the afternoon. Fertilise in the middle of the day and treat in the same way as for Cucumbers. As soon as it is safe to do so, the frames may be removed altogether, and the plants will be bearing long before those grown in the ordinary way. Keep them well supplied with water and give an occasional dose of artificial manure ; the plants will then continue to bear until late in the autumn.

For the general crop make a sowing the second week in April, and where no heat is available, for the later supplies, another the first week in May. It will not be safe to plant out before the end of May unless means are at hand for protecting them. Ordinary hand-lights are most suitable, and when planting allow

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a distance of three feet between each ; give them a little fresh loam and leaf soil for a start.

Stop and peg the plants down for a week or two and give copious supplies of water.

Unsightly heaps and corners can be covered with Marrows which have a pleasing effect.

CHAPTER VI.

SALADS.

THE cultivation of Salads is not the least important of a gardener's duties, for these in many cases are required for daily consumption the whole year round. Of Salads Lettuce may be said to be the most important so this shall be first considered. By growing suitable varieties of both Cos and Cabbage, and if proper accommodation is provided, there should be no difficulty in obtaining Lettuce throughout the greater part of the year. The best qualities the Lettuce can have are, in spring the property of turning in quickly, in summer to be slow in running to seed, the least susceptible to damp in autumn and winter, and hardness. In order to maintain a continued supply of Lettuce seed should be sown at intervals from January to September. In January sow the seed in boxes and place these near the glass in a gentle heat ; if the cultivation of Lettuce is practised upon a large scale, instead of sowing in boxes, sow either upon the surface soil of a pit under which runs a hot-water pipe, or upon six inches of soil resting upon a mild hot-bed composed of two parts leaves and one of stable manure, in a cold frame.

From the time the seedlings appear they should be

grown sturdily, and must experience no check ; ventilate carefully according to the state of the weather, and so long as there is any likelihood of frost cover the frame every night with mats.

* The variety selected will depend upon whether the cultivator prefers a Cabbage or Cos Lettuce ; the former turns in and is ready for use more quickly than the latter. An excellent Cabbage Lettuce for the early sowing is Golden Queen, a sort that is rather under medium size with smooth green leaves. It forms solid, crisp and tender hearts.

Plants from the early sowing, after being well hardened off, may be planted out on a south border, placing them about eight inches apart. Instead of putting them out in this manner they may be dibbled in a rather rich and light soil in a warm frame, about seven inches from each other. Grown thus Lettuces of the most delicious flavour and finest texture are obtained. Should cold cutting winds prevail after placing the young plants outside, as above mentioned, and in early spring they frequently do, temporary protection, furnished by means of mats or branches of laurel one foot or two feet long, must be given. Place these branches in the ground between the plants all over the bed, and there let them remain until the Lettuces are established.

If a Cos variety is required Veitch's Superb White, a selection from Paris White, is excellent. Growing as it does larger than Golden Queen, this variety must be placed at least two inches further apart when planted out.

About the first week in March a sowing may be made out of doors on a south border. Sow thinly so that the seedlings may have plenty of room to properly develop. Whether the sowing is made a few days sooner or later is not material, but take the first opportunity when the ground is in a suitable state, *i.e.*, when it can be trodden or raked without its adhering to either one's boots or the rake.

After sowing fix a net over the bed, keeping it a foot or more above the soil by means of sticks. The two varieties recommended above for sowing under glass in January may be sown in early March outside, with, in addition, the Cabbage Lettuce New York. This variety will stand a long time in hot weather without running to seed, and by the time the plants from early sowings are ready for cutting, hot weather is not unusual.

Holborn Standard, another Cabbage Lettuce, much resembles New York, except that it is a lighter green : both varieties are large with crinkled leaves, and form large tender and crisp heads of the first quality. These attributes considered, together with the fact that they do not easily run to seed, mark them as the best of summer Cabbage Lettuce.

Veitch's Chelsea Gem is also a good Cabbage variety for summer, of medium size with smooth leaves.

Of Cos varieties for summer, Mammoth White is, taking all things into consideration, as good as any, though it is closely followed in point of merit by White Cos.

Whether one or more of these summer Lettuces is grown, frequent sowings are necessary to maintain an uninterrupted supply. As soon as the seedlings from the first sowing out of doors commence to form the first rough leaf second sowings should be made, and when the resulting seedlings have reached a similar stage, sow again and so on to the end of the season. During the months of May, June and July sow the seeds thinly in drills on a north border, making the drills twelve inches apart. At the end of June discontinue sowing the summer varieties, with the exception of Mammoth White, which is sown once more early in July. There are also sown Sugarloaf, Grosse Parisienne and Lee's Immense Hardy Cabbage. The first and last named are of medium size and the French variety is large; all are valuable for autumn use. These three varieties are selected for the second sowing in July, which, together with the subsequent sowings, is larger than those made previously, so as to provide a plentiful supply of plants for planting out for the autumn and winter supplies. Early in September the last sowing of the season is made on a south border, the varieties used being Sugarloaf, Lee's Immense Hardy, Bath or Brown Cos, and a good summer Cabbage variety such as Perfect Gem or All the Year Round. The first three mentioned are quite hardy, the last two are more tender, as also are some others that are good for summer use, although they survive the winter.

As soon as large enough the best plants from the

September sowing should be planted out on a south border there to remain during the winter. They will be ready for cutting during late April and May. Brown Cos is at that season excellent, tender, crisp and sweet. The smaller plants are left in the seed bed throughout the winter. Should there be insufficient plants from the last sowing out of doors, sow again in October in a cold frame, leaving the plants there during the winter, and plant them out in the spring.

Although some varieties of Lettuce are quite hardy when the plants are small, they are much more tender when fully grown and blanched. In the month of October therefore some provision should be made to protect them from frost.

Those that are fully grown and are ready for use may be protected by means of mats supported by rods that are attached to short stakes driven into the ground. When there is a likelihood of frost put on the mats at night and remove them in the morning.

The best protection that can be given to autumn and winter Lettuce is to lift those that are well developed (excepting those for immediate use) and plant them in a cold frame or a pit close together but without being crowded.

In lifting, care should be taken to preserve as many roots as possible ; the plants ought also to be graded into two or three sizes, so that when they are cut the pit may be cleared by commencing at one end and proceeding uninterruptedly. This practice admits

of others being brought in from outside that have developed since the first lot of plants was lifted.

Another method of protecting the Lettuces is to place frames over them as they are growing : rough three-light frames are very useful for this purpose. Mats and long stable litter should be used for covering at night, taking care to place plenty of the litter around the sides of the frame.

During mild weather draw the lights off, tilting them at the back instead when it rains. Ventilate every day when the temperature is above freezing point.

From a sowing made late in the month of August of both Cabbage and Cos varieties, part of a frame or cold pit may be planted : they will provide excellent Lettuce by April.

The plants raised from seed in September and put out on a south border should, in January, be planted in a heated pit in soil resting upon a mild hot-bed. These quickly develop into Lettuces of the best quality. Cabbage varieties are best suited for this treatment.

Plants from a sowing made in January, upon a hot-bed, will succeed the first early crop sown in the autumn.

Planting.—The distance apart at which Lettuces should be planted depends upon what size they attain when fully grown. Small-growing varieties may be planted eight inches distant from each other, those of medium size at ten inches and the larger ones twelve inches apart.

It is necessary to tie some Cos varieties in order to cause them to blanch, and this should be done a fort-

night before cutting. Cabbage varieties should not need tying, those that do require it we do not think worth growing.

To obtain the best Lettuce, well cultivated, rich ground is essential. Liberal and frequent waterings are also necessary during hot and dry weather. At no time of the year, whether under glass or out of doors, must the soil be allowed to become dry.

Insect Pests.—Slugs are frequently troublesome ; as soon as the seedlings appear above ground they often eat them off. We know of no better method of checking their ravages than by dusting over the seedlings with freshly slaked lime. This is done preferably early in the morning. During showery weather it may be necessary to do this almost daily.

The frequent use of the hoe is an important factor in the successful cultivation of the Lettuce.

ENDIVE.

As a Salad, Endive ranks next in importance to Lettuce ; it provides a welcome change from the latter, and assists to maintain the supply of Salads well into the winter. The best varieties are Round-leaved Batavian and Green Curled. Successive sowings may be made from June to August. Give the plants the same treatment as the Lettuce received, planting as far apart as recommended for the largest Lettuce. Both the above-mentioned varieties must be tied to enable them to be blanched perfectly.

SALADS

CHICORY

Is a good Salad for use in January and February when Lettuce is scarce. It has, however, a bitter taste which many do not care for. May is the most suitable time to sow Chicory. Make the drills fifteen inches apart in which the seed is sown, and subsequently thin the seedlings to six inches apart. The roots are finally lifted and forced in a dark structure, such as the Mushroom house, in a similar manner as is adopted for Seakale.

CORN SALAD OR LAMB'S LETTUCE.

Corn Salad or Lamb's Lettuce makes a welcome addition to the list of Salads, for it is also in season when others are scarce, *viz.*, during February and March. Sow in drills one foot apart in June, and when the seedlings are well through the soil thin them out to four inches apart. Corn Salad is quite hardy.

CELERY

Also makes a splendid winter Salad either alone with the usual herbs or in a mixed Salad. In preparing it cut the blanched leaf-stalks across in small pieces.

TOMATOES

Provide a delicious and favourite Salad ; one may use them alone or in a mixed Salad. Their increased

utility and popularity are accounted for by the fact that they may be had throughout the greater part of the year.

Other Salads are Cucumbers, Radishes, Mustard and Cress, Water Cress, Celeriac, Stachys, French Beans, etc. Indeed there are few vegetables that are not suitable for the Salad bowl.

Salads are very wholesome ; they retain properties that are lost by other cooked vegetables. Lettuce and Endive should not be washed if it is at all possible to remove the dirt from them by means of a dry cloth.

HERBS

Play an important part in flavouring Salads. Tarragon is in demand every day of the year ; from April to October the supply is provided by plants grown outside and from October to April by forcing. To be able to maintain an uninterrupted supply a fresh plantation of young plants should be made every spring : plenty of roots will then be available for forcing. The soil for the cultivation of Tarragon should be light ; if it is at all heavy add spent Mushroom bed manure and burnt earth. This herb is increased by division of the roots. The best roots for forcing are those two years old, as they are then of a convenient size for placing in pots or boxes. Early October is the best time of the year to lift them.

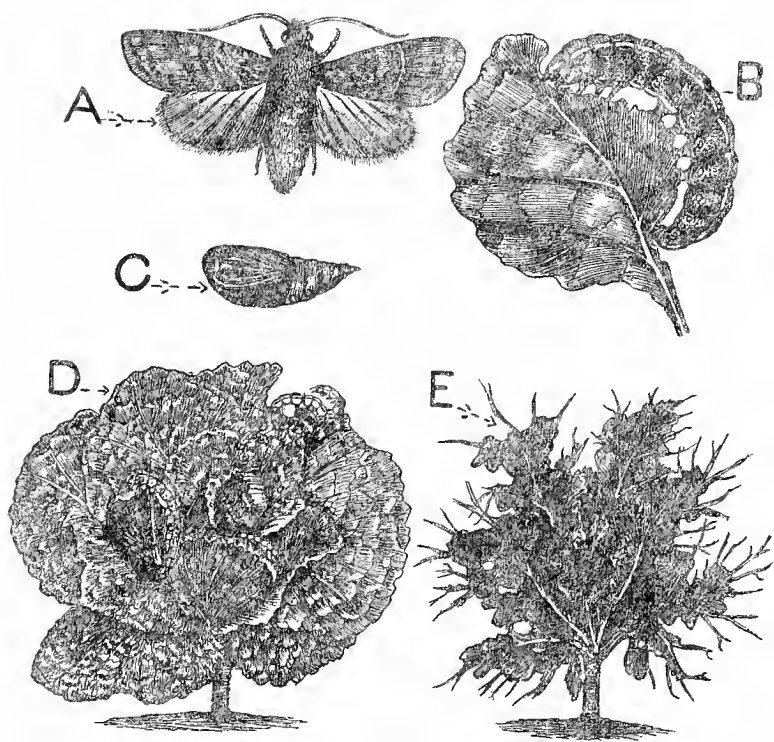
CHAPTER VII.

VEGETABLE FOES AND DISEASES.

CABBAGE MOTH (*Mamestra brassicæ*).

THE Cabbage Moth (A) is of a rich brown, the upper wings with a decided tinge of grey and variously marked with black streaks and circular lines ; the lower wings are brown and dirty-white at the base.

The moth lays her eggs on the leaves of Cabbages, Savoys, etc., and the caterpillars hatch in a few days and immediately begin to feed. At first they are usually green, but afterwards vary much in colour, some being pale dingy green ; some green and black above, but mostly of a dark colour with a kind of marbling, more or less distinct on the back, the effect being produced by a triangular mark containing two white dots on each of their segments. When full-fed the caterpillar (B) is upwards of an inch and a quarter in length. On being disturbed it rolls itself into a tight ring, and so remains until it supposes danger is over. The caterpillars descend into the earth for change into pupæ or so-called chrysalids. The pupa-case (C) is smooth and red-brown, and in this the pupa remains, protected by earth, until the following summer, when



CABBAGE MOTH.

the moth comes out, sometimes in May but usually later in the summer.

Attack by Cabbage Moth caterpillars occurs regularly in the summer and autumn of each year, which is not to be wondered at, for they feed on leafage of many common plants, even such wildlings as the Dock, and may be found in the flower garden on Dahlias, Geraniums and Marigolds, also in fruit quarters, on the Red Currant ; therefore the infection may easily be due to outside influence. The attacks, however, are most demonstrative on Cauliflowers, and on the hearts of Cabbages and Savoys in the late summer and autumn, for the caterpillars are very voracious, feeding by day and night, and, what is worse, they spoil with their excrement more than they eat. The excrement from the caterpillars either remains in lumps between the leaves, or spreads downwards in wet dirty green matter. Besides, the caterpillars gnaw large holes into the hearts of the Cauliflowers, Cabbages or Savoys, and render the infested plant truly disgusting, of which some faint idea may be seen in figure E.

Prevention.—The moth appears in May and June and later. 1. To capture them : (a) Fix a post in the ground firmly and standing out about three feet, the top being cut off square. Affix a wide tray, wooden or metal, on the post and smear it inside with a sticky substance, such as two parts resin and one part sweet oil melted. Place a thin block of wood in the centre of the tray, and on this stand a hurricane lamp. Light it at dusk each night. The moths

come to the light and are caught in the sticky matter. (*b*) Take half a pound of sugar, dissolve it in beer, and boil the mixture until the two substances are thoroughly mixed. After dark fasten a bull's-eye lantern on a belt, put a few spoonfuls of rum into the beer and take a gauze net, usually called a butterfly net. Mark all the convenient spots, such as patches of bare walls and trunks of trees, and on these with a brush bestrew the sugar and beer liberally within the circle of light thrown by the lantern, and so on from station to station, not using the treacle so thinly that it runs. In half an hour examine the treacled patches, and the moths will be so eagerly engaged upon their feast that they may readily be captured or killed. Not only upon the sugar will the moths be found, but sitting on the neighbouring plants, walls, or even ground, and the entomological net will be handy for capturing them. Many garden foes beside Cabbage Moths like treacle; even a board painted with the sugared mixture and placed in a room where the windows are open will give a rich harvest of Cabbage Moths and that means, if they are captured and killed, fewer caterpillars for preying on Cabbages and Savoy.

2. Where the Cabbage Moth caterpillar has been much in evidence on the autumn Cabbage tribe crops, the pupæ or chrysalids will be turned up in great numbers at the winter digging. These should be collected into a basket and given to poultry or at once destroyed. Fowls are particularly fond of the pupæ, and on an infested plot will even scratch for them.

However turning up and hand-picking is the most certain process. Even forking the ground over at intervals and collecting the chrysalids, or exposing them on the surface to alternate cold and wet have a good effect.

3. Dress the ground with gas lime fresh from gas works as soon as the infested crop has been cleared at the rate of 70 lb. per rod, and leave on the surface and spread evenly a month or six weeks before digging or ploughing in.

Remedies.—1. Hand-picking is the surest method. It is astonishing how large an area can be got over in a day by a person with a will and nimble fingers boldly taking the caterpillars one by one or, where thick, twos and threes, between the fingers and crushing them, having handy, say at each end of long rows, a pail or can of water wherewith to cleanse the hand. Chicken-hearted persons are no good for contending against the Cabbage Moth caterpillars, being afraid to handle and destroy what will assuredly ruin the Cabbage crop if let alone. Some children will search for and pick the caterpillars from between the folds of the Cabbage leaves, promptly placing them in a vessel containing a little paraffin oil, and under due supervision the Cabbage crops may be well and rapidly cleared at small expense. It is very important to attend to the hand-picking when the caterpillars first appear and before any serious harm is done (D), or they will very soon render the Cabbages or Savoys quite useless.

2. Note when the caterpillars are feeding, usually in the early part of the day, and dispersed over the plants. Then have boiling hot water ready, and with a watering can with a fine rose sprinkle it over the caterpillars. If held high up the hot water will fall on the caterpillars at a temperature of about 150° , and unless applied excessively will not injure the plants while cleansing them from the caterpillars. Every caterpillar within reach of hot water at a temperature of 130° to 135° will be killed, therefore the operator must so apply the hot water as not to injure the Cabbages by having it too hot, and yet have it hot enough to kill the pests. Hot water deservedly claims preference for freeing *Brassicæ* from caterpillars.

3. Paraffin oil emulsion. This is readily made by dissolving a pint of soft soap in a quart of soft water. When dissolved remove from the fire, and while still boiling hot add half a pint of paraffin oil and immediately churn the mixture with a small hand syringe. In five minutes a perfect emulsion will be formed, which should be diluted with ten times its volume of water for use. Apply by means of a fine rose watering can or a spraying apparatus. This preparation has the disadvantage of tainting the heads if applied to the fully developed plants, hence is best used when the plants are young, or at least a month should elapse after treatment before cutting the Cabbages for use on account of the smell and taint.

4. Carbolic acid emulsion. Made by dissolving one quart of soft soap in a gallon of boiling water, into which one pint of crude carbolic acid is then poured and the whole stirred into an emulsion, in which condition it will remain for a long time. For use dilute one part of the emulsion with thirty parts of hot water, stirring well and using at a temperature of 135° by means of a knapsack sprayer. This preparation, like paraffin oil emulsion, is best applied when the plants are young. It is not advisable to apply it after the plants have commenced to heart. The smell appears to deter the moths from depositing eggs in the plants, and it also acts as a deterrent of the Cabbage Fly, *Phorbia brassicæ*. Spray at intervals of ten days or a fortnight from the plants being set to their beginning to head or heart.

5. Pyrethrum (insect or buhach) powder is excellent for killing common Cabbage caterpillars. It should be fresh, and may be mixed with six or eight times its bulk of flour, and dusted on the plants with a dredger or bellows apparatus. Or the powder may be mixed with water in the proportion of one ounce to three, four or five gallons of water, sprinkling or spraying upon the plants. The dusting or spraying should be performed about once a week during the time the worms are present, then they will cause little or no trouble.

THE ILLUSTRATIONS REPRESENT THE CABBAGE MOTH AND ATTACK
ON SAVOY.

CLUB-ROOT, FINGER-AND-TOE (*Plasmodiophora brassicæ*).

The excrescences and malformations of Cabbage and Turnip root-stems are well known to all cultivators as "anbury," "club-root," and "finger-and-toe". It is not only that the roots are malformed but their growth is hindered ; and as the plants are usually attacked in their early stages, the crop is frequently almost entirely ruined. The root is the part most frequently attacked, but the pest also disturbs the leaves, at least in the case of Cabbages, yet no distortion occurs, as in the root. Cabbage plants attacked by this slime-fungus are prevented from properly developing leaves and forming hearts. Affected Broccoli and Cauliflowers produce small misshapen heads, and sometimes only stunted leaves. In the case of Turnips the roots are swollen and the bulb warted, eventually rotting and emitting a disagreeable smell. All Brassicæ are liable to be infested by *Plasmodiophora brassicæ*, and it occurs on Charlock and other weeds belonging to the Order Cruciferæ. It belongs to the group of fungus-like organisms known as Myxomycetes or Slime-Fungi, and the name *Plasmodiophora* means the bearer of plasmodia, which are masses of protoplasm with creeping, life-like movement.

The disease is first contracted by spores present in the soil, from which independent minute portions of protoplasm escape under favourable conditions of

moisture and temperature. These move about by means of thread-like appendages or cilia, and probably at first lead a saprophytic mode of life, living upon organic matter in a state of decay or in solution of rain water. After a time two or more of these bodies unite together, then form plasmodia growths, either in the soil or in the host-plant, entering this by the root-hairs or through the cuticle. Once inside a living cell the parasite forms a mass of protoplasm, which increases and passes from one cell to another devouring their contents. After vegetating for some time and causing the infected cells to increase in size and produce the swellings known as "club-root," the plasmodium differentiates, and ultimately becomes resolved into many minute round spores, which on the decay of the root are liberated in the soil. When the spores are set free they probably germinate, and form a plasmodium that exists as a saprophyte ready to seize upon any plant root affording the essential food, or remain quiescent and awake to active life in the presence of a peculiar host-plant. On these points nothing is known with certainty, though if Cabbage, Turnips, or other allied plants are sown or planted in soil on which diseased plants have been produced in the previous season, or even two or three years previously, such plants will become diseased also.

Prevention.—From the nature of this infection remedial measures can have only a palliative effect. It would, however, be desirable to apply a good dressing of lime when the first symptoms of the infection

are noticed, the lime, half a bushel per rod, eighty bushels per acre, being applied as soon as slaked with the smallest quantity of water necessary to cause it to fall into an apparently dry powder, and work it into the soil with hoes.

Lime (stone lime preferably, as it acts more powerfully than that made from chalk) has been proved frequently to be a preventive of club-root. It should be applied hot to infected land and dug or ploughed in to the depth of three or four inches. A dressing of stone lime every eight or twelve years has secured immunity from the disease, while where chalk lime has been used the dressing must be repeated every four, or at most eight years. Eighty bushels per acre, half a bushel per rod, of quick lime is the proper quantity. As the plants are most susceptible to the disease shortly after germination, it is a good practice to dress the land before sowing or planting with forty bushels per acre, or half a bushel per rod, of hot lime, particularly land liable to club-root. When a Brassica crop is affected, this is usually sufficient to arrest the disease.

In bad cases, and where procurable, gas lime, fresh from gasworks, at the rate of two to four tons per acre, quarter to half cwt. per rod, will be found more efficacious than ordinary lime, broadcasting it evenly after the diseased crop is cleared, or in autumn in advance of preparing for cropping. Leave it on the surface a month or six weeks before digging or ploughing in ; this has been found a complete cure and pre-

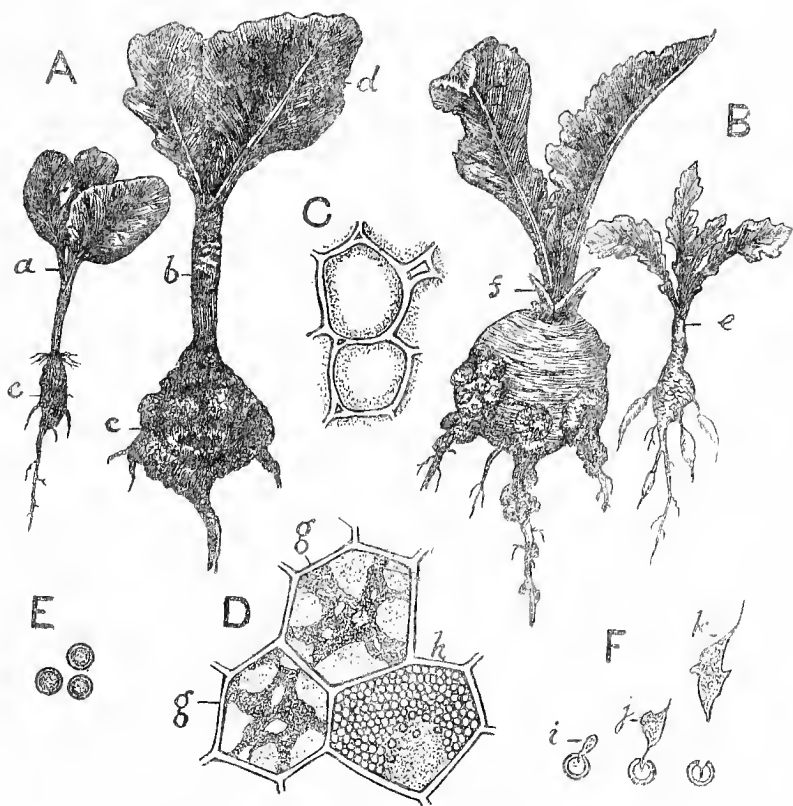
ventive of clubbing on infected land, thus enabling the cultivators to grow Brassicas at frequent intervals—almost yearly—upon the same soil, as the applications of gas lime, and also of quick lime, destroy the germs of the disease in the soil.

From the nature of the disease it is simply soliciting attack to sow or plant Cabbages, Turnips, etc., in affected soil, hence it is imperative to disinfect such soil, either with lime or gas lime, before the land is again cropped with Brassicas.

As the slime-fungus requires an acid medium for proper development, manures soaked with sulphuric acid, such as superphosphate and dissolved bones, should not be used, for the acidity, especially that of sulphur, favours the spread of the disease.

Clean culture is also important. Never tolerate such weeds as Charlock, Garlic, Mustard, Shepherd's Purse, and other crucifers where cultivated plants of the Order Cruciferæ are grown, for they may render the land foul, even when under other crops, and when Cabbages, Turnips, etc., are sown or planted these become infected.

All diseased plants should be collected and burned, not throwing them on the manure heap to start the disease anew, or even in a new locality where the manure is applied. Too much care cannot be exercised with regard to infection by introducing soil on cart or barrow wheels, tools, etc., from an infected field or garden to a new locality, as this is sufficient to start the disease.



CLUBBING IN CABBAGES, FINGER-AND-TOE IN TURNIPS.

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THE ILLUSTRATIONS REPRESENT CLUBBING IN CABBAGES, FINGER-AND-TOE IN TURNIPS.

A, clubbed Cabbage plants : *a*, young plant from seed or pricked off bed at stage of lifting for final transplantation ; *b*, transplanted plant with disease fully developed ; *c*, swollen and clubbed condition of root-stem ; *d*, stunted and blackened state of leaves in advanced stage of disease. B, Turnips attacked by club-root fungus : *e*, seedling Turnip with finger-and-toe ; *f*, young Turnip showing wart or knob malformation. C, normal cells (cellular tissue) of Cabbage root-stem. $\times 200$. D, cellular tissue of Cabbage root-stem with club-root fungus : *g*, cells containing plasmodium ; *h*, cell crowded with spores of the fungus. $\times 300$. E, spores of club-root fungus, *Plasmodiophora brassicæ*. $\times 670$. F, spores germinating : *i*, spore with protoplasm protruding ; *j*, plasmodium consisting of naked protoplasm emerged from spore ; *k*, a plasmodium after union with another. $\times 670$.

CARROT FLY. (*Psila rosæ*.)

The Carrot Fly is shining black slightly tinged with a greenish colour. It has yellow legs, white "balancers," and hyaline transparent wings ; the head is reddish-yellow, and the antennæ and palpi tipped with black. The larva is cylindrical, and of a pale yellow colour ; the body tapers slightly towards the mouth, while the other end is rounded ; its skin is smooth and shining, the tail has two little black tubercles. The pupa is light brown in colour and of long-oval form.

The damage done by the larva, popularly termed grub, maggot, and worm, of the Carrot Fly is known

as "rust," from the peculiar reddish or rusty colour to which the gnawed parts turn. It attacks all parts of the Carrot root by gnawing galleries in the surface, or into the substance of the root, but whilst the roots are young the grub generally attacks the lower part. Infested Carrots may be known by the outer leaves turning yellow and withering, while the roots gradually sicken and die from the injury to the fleshy part, the growth of the root-fibres being also often completely destroyed. In consequence of attack by Carrot Fly larvæ or grubs the crop is almost entirely lost in some gardens.

The attack usually begins early in summer when the Carrots are from two to six inches high, the fly depositing eggs on or by the root, and the larvæ when hatched eat their way into the fleshy part. When full-fed the grubs turn to pupæ in the earth, and the fly comes out in three or four weeks in summer, but in winter the pupæ remain unchanged, and the fly does not come from them till the following spring or summer.

Prevention.—The cultural points to be attended to are : 1. Such preparation of the ground in autumn or winter as will ensure favourable conditions for a healthy vigorous growth from the first germination of the seed. 2. Thinning at such a stage of growth as after thinning may least expose the plants to the attacks of the Carrot Fly, the operation of thinning evidently attracting the fly and affording facilities for the depositing of eggs on or near the Carrots owing to

the loose open nature of the soil consequent on the thinning. If Carrots require thinning it should be done when an inch or two high. 3. The ground intended for Carrots should not be that occupied in the previous year by them, or even by an umbelliferous crop, and though the ground should be in good heart from manuring for a preceding crop, it is not advisable to apply manure specially for the Carrots, but trenching and, if need be, applying the manure in the autumn, keeping it a foot or fifteen inches from the surface. If kept in the top spit, the manure must be well rotted and applied in the previous autumn.

Dressings to avoid attack are : 1. Roughly dig the ground intended for the Carrot crop at the beginning of winter and apply gas lime, at the rate of two and a half to five tons per acre, thirty-five to seventy lb. per rod, and leave on the ground till late winter or early in spring and then dig in with a fork about four inches deep or apply the gas lime early in spring, but only the lesser amount ; leave on the surface a month or six weeks and then dig in in time to secure a good tilth or fine surface mould.

2. Apply a dressing of wood ashes half an inch thick all over the ground and dig in a spit deep, making the surface level and fine, dusting a peck of soot per rod on the surface. The ground is then ready for the seed.

3. Broadcast kainit on the land in spring a short time in advance of sowing, say in February or March, at the rate of two and a half to five cwt. per acre, one

and three quarters to three and a half lb. per rod, and point in very lightly after it has been broadcasted on.

4. Dressing the ground with lime the previous autumn, or the drills with lime and soot (two parts of lime and one part of soot) when sowing is sometimes a good preventive.

5. Mix a quart of paraffin oil with a barrow load of wood ashes (about one cwt.) and broadcast in the ground at the rate of a peck per rod after sowing the seed. When the plants are about four inches high apply a second dressing of the mixture.

6. Water the ground with gas liquor, diluted with about five times its bulk of water, before sowing, applying about as much as in watering a seed-bed. In case of attack, watering with gas liquor, diluted with twelve times its bulk of water, is a good remedy.

Watering the ground with diluted soluble phenyl before sowing, and copious watering with an application of the same, stops attack and throws the Carrots into vigorous growth. A fluid ounce of Little's soluble phenyl to six and a quarter gallons of water does not injure the Carrots, but it should not be used over the foliage. Lastly there remains the dressing with spirits of tar mixed with sand, one gallon of the first to a barrow load of the latter, the quantity sufficing for two rods of ground. The dressing may be applied in autumn and dug in, or after the Carrots are sown, or it may be strewed at the time of sowing.

All diseased Carrots should be pulled up and

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burned, as once sickly they seldom form good roots afterwards, and infected Carrot beds should be thoroughly cleared of roots in the autumn, dressing the land with gas lime.

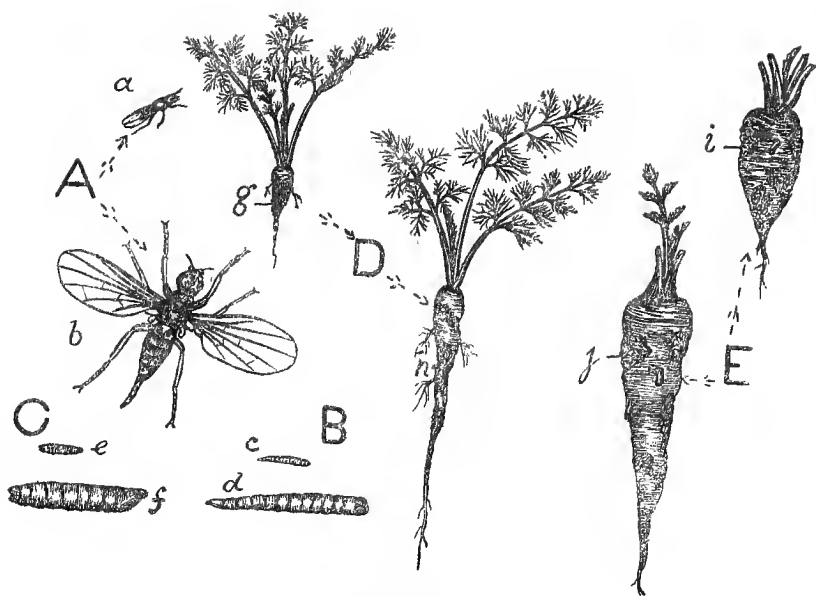
Carrots from seed sown in July seldom contract the disease, and the produce is very serviceable for winter use.

THE ILLUSTRATIONS REPRESENT CARROT FLY AND ATTACK ON CARROTS.

A, Carrot Fly · *a*, natural size ; *b*, enlarged three diameters. B, larva, commonly called *grub*, of Carrot Fly : *c*, natural size ; *d*, magnified three times. C, pupa, sometimes called fly-case : *e*, natural size ; *f*, enlarged three diameters. D, attack on Carrots in early stages of growth : *g*, on the *short* varieties, or Early Horn section, the lower part being rusted or eaten away ; *h*, on the *long* varieties or Long Horn, James' Intermediate, and Long Red Surrey, the lowest part or radicle being destroyed as well as other portions of top root or Carrot rusted. E, attack on Carrots when of usable size : *i*, on *short* Carrot, the grub gnawing galleries on the surface, producing a scabby rusty appearance, and eating into the substance of root, spoiling it for use ; *j*, in *long* Carrot, with two grubs partly out of flesh.

CELERY FLY. (*Tephritis onopordinis*.)

The Celery Fly is very small, one-eighth to three-sixteenths of an inch in length with a wing expanse of nearly or quite half an inch. It is tawny brown in colour, with the under part of the body light coloured, wings iridescent, with oblique lines of brownish spots running through them ; legs dark yellow, and covered



CARROT FLY.

with black hairs. When at rest on the Celery or Parsnip plants the wings are folded in an upright direction.

The fly first appears in April, and the female, larger than the male and furnished with an ovipositor, places eggs singly upon the upper sides of the leaves or leaflets of Celery and Parsnip plants. Each female deposits many eggs, the larva or maggot hatching out in about six days, and this at once enters the leaf tissues and forms a mine within them. The maggots or larvæ are light green, legless, the dark line of the alimentary canal being visible along the back. The body is somewhat thick, pointed at the head and squared off at the tail end, upon which there are black tubercles. In about a fortnight the larva is full-fed, when it changes to a pupa, either in the leaf or in the ground. The pupa case is oval, of a light yellow colour, sometimes brownish, barrel-shaped, wrinkled and about one-eighth of an inch long. The fly comes from the pupa-case in a few days. There are several broods in the course of the summer, and the pupæ of the late generations remain in the earth and in pieces of leaf and stalk, the flies emerging the following spring or summer.

Great injury is frequently done by the larvæ or maggots of the Celery Fly to Celery and Parsnips. They make mines or passages in the leaves, and feed upon the soft juicy substance. The attacked leaf or rather leaflet soon contracts, whitish patches appear, at first small but quickly increasing in size, involving a large portion of the leaflet, and in a short time it shrivels up. As many or most of the leaflets are

thus affected, the Celery is seriously crippled, sometimes ruined, as the stalks cannot, for lack of the elaborating functions of the leaves, grow and fill out properly. Besides, the affected parts decay, contaminating the stems, the blanched ones not uncommonly having rusty marks, due to the passage of Celery Fly larvæ down the stem, more or less spoiling the appearance and flavour, and often associated with Celery-stem Fly larvæ and causing the Celery to rust.

Parsnips are also attacked by *Tephritis onopordinis*, the leaves of the plants being much injured in some seasons by the larvæ, and the roots of the plants affected are small in proportion to the damage done to the foliage.

Prevention.—1. In the early stages of infection the attack may be checked in gardens by pinching the white spots or blotches on the leaves between the finger and thumb so as to kill the larvæ in them. The plants must be kept under close observation, even from the earliest stages, as the fly appears in April and maggots have been found in the leaves of Celery as late as the beginning of December. Pinching must be done carefully, so as to damage the leaves as little as possible.

2. Dusting the leaves with a mixture of finely powdered lime and soot in the proportion of one bushel of lime to three bushels of soot has been found efficacious, if put on when the leaves are damp from dew or rain. It prevents the flies from laying eggs upon the leaves, and prevents other pests infesting

the plants in the stems and roots, and is an excellent fertiliser. The dressing requires to be repeated at intervals of a fortnight or three weeks, scattering the mixture over the plants whilst the leafage is wet with dew.

3. Spraying the plants with a mixture of paraffin oil, soft soap and water, at the rate of a quart of paraffin and half a pound of soap to ten gallons of water, has been found effective in preventing attacks of the fly. This paraffin oil and soft soap must be thoroughly incorporated in a small quantity (eight times that of soft soap) of boiling water, churning for five minutes with a small hand syringe to form a perfect emulsion, and then dilute to ten gallons, applying when cool enough, as the emulsion is best diluted with hot water, by means of a knapsack machine, spraying very lightly on the plants, or, in case of small areas, try a fine-rose watering can. The spraying will require to be done twice or more often during the season.

Other good washes that have proved beneficial are :
(a) Carbolic acid, one pint, and soft soap, half a pound, to ten gallons of water, thoroughly incorporating the acid with the soft soap, and then diluting with water.
(b) Gas tar water : half a pound of gas tar boiled for half an hour in two gallons of water, diluting to fifty gallons with water. This is, perhaps, the most repugnant of all washes to leaf-blister flies.
(c) Boil four ounces of quassia chips in a gallon of soft water for a quarter of an hour, and dissolve in it, as it cools, four

ounces of soft soap, straining and diluting to two gallons with hot water, using when cool. The forementioned washes should be sprayed or sprinkled on the plants at intervals of a fortnight or three weeks.

4. As many of the pupæ remain in the earth during the winter, it is important to level the ground after the Celery crop has been cleared, both in the case of infected Celery and Parsnips, and to collect and burn all foliage and stems directly the crops have been dug, then apply a dressing of gas lime, fresh from gasworks, at the rate of seventy pounds per rod, or five tons per acre, spreading evenly and leaving on the surface a month or six weeks before digging or ploughing in deeply. Where gas lime cannot be readily got a dressing of stone lime may be used in double the amount to that of gas lime. In gardens burying the upper surface deeply, as in trenching, is a good practice, as it prevents the flies from coming up. By pursuing this procedure there is little danger of attack from Celery Fly from a previously infected crop.

5. The trimmings of infected Celery or Parsnip crops should not be placed on rubbish heaps, as the pupæ in infected leaves and stems are likely to be carried out with compost or manure, and the flies coming out attack Celery or Parsnip crops growing near. If not collected and burned, or put on manure heaps in a high state of fermentation, the *débris* of infected crops is almost certain to be a source of renewed attack.

6. In order to induce free growth in attacked

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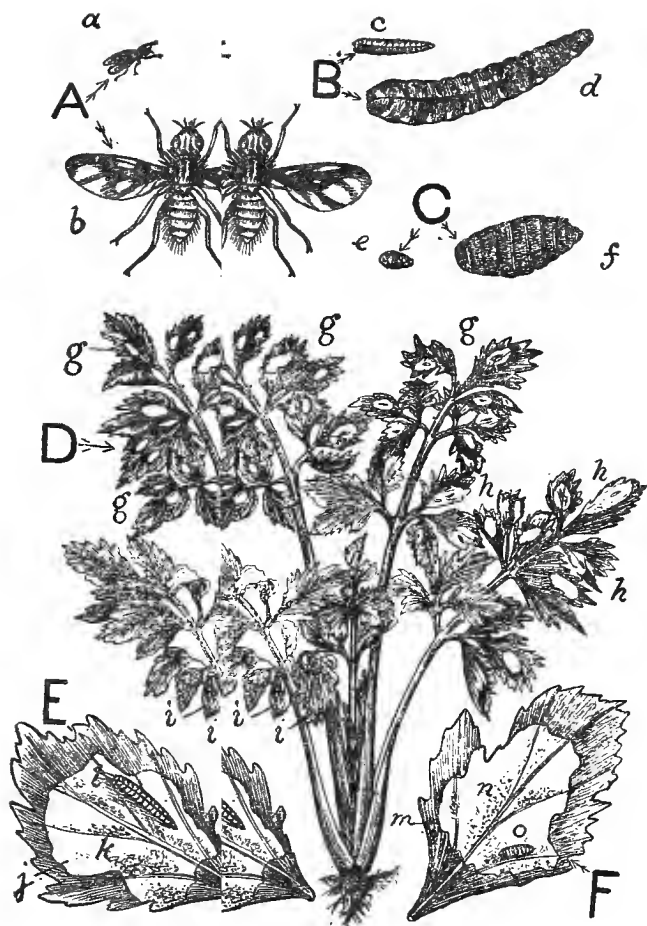
plants finely crushed nitrate of soda, mixed with a little agricultural salt, will be advantageously applied alongside of the plants in the trenches, not scattering on the foliage, but on both sides clear of the plants, about an ounce of the mixture per yard run of row, repeating at intervals of a fortnight or three weeks.

THE ILLUSTRATIONS REPRESENT CELERY AND PARSNIP FLY.

A, fly: *a*, natural size; *b*, enlarged three diameters. B, larva commonly called maggot: *c*, natural size; *d*, magnified three times. C, pupa or pupa-case: *e*, natural size; *f*, enlarged three diameters. D, attack of Celery Fly on Celery: *g*, blisters or whitish blotches on leaflets in early stage of attack; *h*, more advanced stage of devastation; *i*, leaflets destroyed by Celery Fly larvæ. E, leaflet of Celery showing: *j*, blister caused by Celery Fly larva eating inner portion of leaf; *k*, dirt or excrementitious matter of maggot; *l*, larva or maggot. F, leaflet of Celery showing: *m*, blister; *n*, dirt of maggot; *o*, pupa, sometimes present in blister.

ONION FLY (*Anthomyia ceparum* Syn. *Phorbia cepetorum*).

The Onion Fly is not unlike the common house fly in general appearance. It is of a blackish colour, thickly powdered with grey; the sides of the thorax are pale, and there are three dark lines on the back. In certain lights the abdomen has a whitish lustre, with, in the male, a darker medium stripe. The eyes are separated in the male by a slender, black, white-bordered line; the face has a pale lustre and the forehead is black, as are the antennæ and palpi; the legs are pitch black, the wings



CELERY FLY.

being pale grey, and the pincers white. The length of the insect is about one quarter of an inch. In the female, the forehead is broad, with a reddish-brown, vertical medium stripe, and the body is more ochreous in colour than the male.

The Onion Fly causes serious injury to the Onion crop in some seasons, large percentages of the plants being quite spoiled, both in large and small areas. The first indications of its presence are shown by the largest leaves of the Onion plants becoming yellow and afterwards whitish ; if these are pulled they come easily away from the stem, and gradually the other leaves become yellow and decay. The bulb will be found to be small and badly shaped, and to have yellowish maggots within its folds feeding upon it, this eventually causing it to become rotten and useless. In other cases the outer or lower leaves of the plants are seen to be lying on the ground, still green, whilst the leaves remaining upright and green feel soft and flabby. If infected plants are examined it will generally be noticed that in the case of very young plants they are eaten through just above the swelling bulbs by the maggots or larvæ of the fly. In older plants, with large bulbs, maggots of all sizes will be found within the bulbs.

The flies appear in early summer, and the female lays six to eight eggs on an Onion plant upon the leaves, and just above the ground or on it. The eggs are white, long-oval and readily seen with a pocket lens. Larvæ, called maggots, come from the eggs in from five to seven days, and make burrows down into the

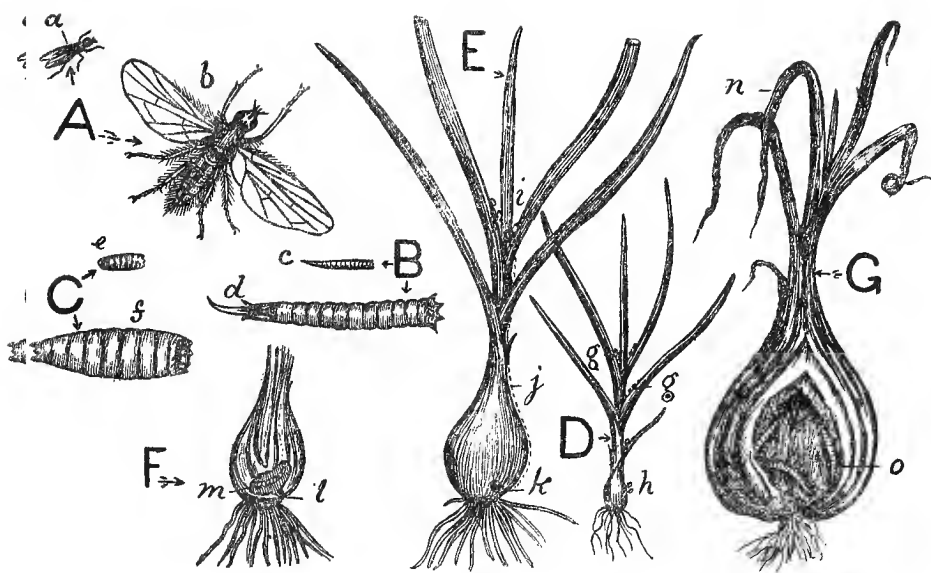
root or bulb between the sheathing leaves. They feed upon the contents of the stem or where a bulb would form, and move on to other plants. Where the bulbs are larger they are occupied by many maggots, feeding on and causing them to become rotten, and in some cases the earth round the bulbs is also infested. The maggot continues in the larval state about a fortnight. When full grown it is about one third of an inch long, dull yellowish-white or dirty-white in colour. The head part of the body is sharply pointed, and the head furnished with a pair of black hooks, which can be extended at will. The tail end is cut off obliquely flat, and in the centre there are two brown breathing tubes, and on the margin of the flat tail end there are eight projections. Before reaching the pupa stage the maggot usually goes into the earth, but sometimes remains within the Onion. The pupa, or its case, is chestnut-brown, long-oval, and from the pupa case the fly appears in from thirteen to sixteen days. In a season there are several generations of the fly. The first has been seen as early as the 25th of April, and flies have been noticed as late as November.

Prevention.—1. Spraying with offensive compositions. (a) Paraffin emulsion made by mixing three pints of paraffin oil and half a pound of soft soap with one gallon of boiling water, mixing being thoroughly done by churning with a hand pump, adding seven gallons of hot water when the Onions are young, and six gallons when they are forming bulbs. The spraying should be dense and in the form of a mist, operating

early in the season, repeating twice or even three times, especially if heavy showers fall after the process. (*b*) Tar water, made by boiling half a pound of gas tar and two gallons of water for half an hour or until it will readily mix, then diluting to fifty gallons, applying as advised for paraffin oil emulsion solution.

2. (*a*) Dusting the plants with a mixture of lime and soot, mixed together in the proportion of one bushel of soot to two bushels of lime, very finely powdered and broadcasted over the plants, afterwards lightly hoeing in, has been efficacious in some degree. (*b*) Sprinkling the young Onions with soot has been adopted with some advantage, but it is necessary to repeat the applications, a peck of soot being applied per rod at each dressing. (*c*) Kainit, broadcasted on land cropped with Onions, at the rate of five cwt. per acre, or three and a half pounds per rod, has been found of great use. It should be lightly hoed in after being broadcasted on. (*d*) Nitrate of soda applied at the rate of one and a quarter to two and a half cwt. per acre, or fourteen to twenty-eight oz. per rod put on infested land, after finely crushing, stimulates the plants and acts badly on the maggots.

3. Sow Parsley with the Onions thinly, the smell of the former being hateful to the Onion Fly. In many farms or gardens the Parsley remains after the Onions, and is sometimes a very remunerative crop. The Onion Fly does not appear to relish umbelliferous crops, hence follow Celery with Onions, not using any manure for the latter crop.



ONION FLY.

4. When Onion plants in a garden or field are noticed to droop and wither all such plants should be taken up and burnt. If taken up with a small three-pronged fork, the maggots will usually be removed with the plant. If this is done early all the larvæ will be got rid of, but if deferred they will have left the bulb and have turned into pupæ in the soil.

5. All pieces of bulbs should be removed from infected land as pupæ sometimes remain in the bulbs, afterwards dressing with gas lime, two and a half to five tons per acre. After spreading evenly and leaving a month or six weeks plough deeply or trench the ground.

6. Wherever possible, Onions should not be grown again for at least one season on land where the crop has been infected, as the pupæ remain in the ground during the winter.

THE ILLUSTRATIONS REPRESENT ONION FLY : ATTACK AND EFFECT
ON ONIONS.

A, Onion Fly : *a*, natural size ; *b*, enlarged three diameters. B, larva, commonly called maggot : *c*, natural size ; *d*, magnified three times. C, pupa, sometimes called fly-case : *e*, natural size ; *f*, enlarged three diameters. D, young Onion at usual earliest stage of attack : *g*, eggs of Onion Fly deposited on leaf bases ; *h*, eggs deposited on ground close to bulb. E, attack on plant after bulb commenced forming : *i*, eggs laid in leaf axils ; *j*, dotted line indicating course taken by maggot after hatching out to base of bulb ; *k*, hole eaten by maggot in passing into bulb. F, section of Onion infested with maggot : *l*, hole made by larva or maggot in entering bulb ; *m*, burrow in bulb with maggot lying in it. G, Onion destroyed by Onion Fly : *n*, top withered ; *o*, centre of bulb decayed with maggots in it.

ONION MILDEW (*Peronospora schleideni*).

This destructive disease appears upon the tops of Onions, at first as a small yellowish patch on one or more of the leaves, and on these discoloured patches presently appears a delicate white coating, not unlike hoar-frost, which speedily changes to a greyish-lilac colour. The diseased patches usually extend until the entire leaf or leaves are affected and ultimately the diseased leaf or leaves fall back and dries up. The disease usually appears early and does not attack the bulb, but this remains very small, and diseased plants generally have a long or "thick" neck. Sometimes, however, the mildew attacks the full-sized bulb, both before and after it is harvested, and commences from the outside.

The threads of the fungus push about between the tissue cells of the Onion leaf, destroying their contents, and causing the collapse of the leaves. Certain branches are sent out through the breathing pores of the leaf, on which the spores are developed, as shown in B, p. 237. These pointed-oval spores are carried by wind or rain on to the surface of neighbouring healthy leaves, where they germinate at once, enter the tissues of the leaf, there give origin to mycelium, that soon produces fruiting branches, and the spores from these in turn infect other plants.

Besides the conidia or summer spores, the fungus develops resting spores or oospores within the tissues of the diseased leaves. These resting spores have a

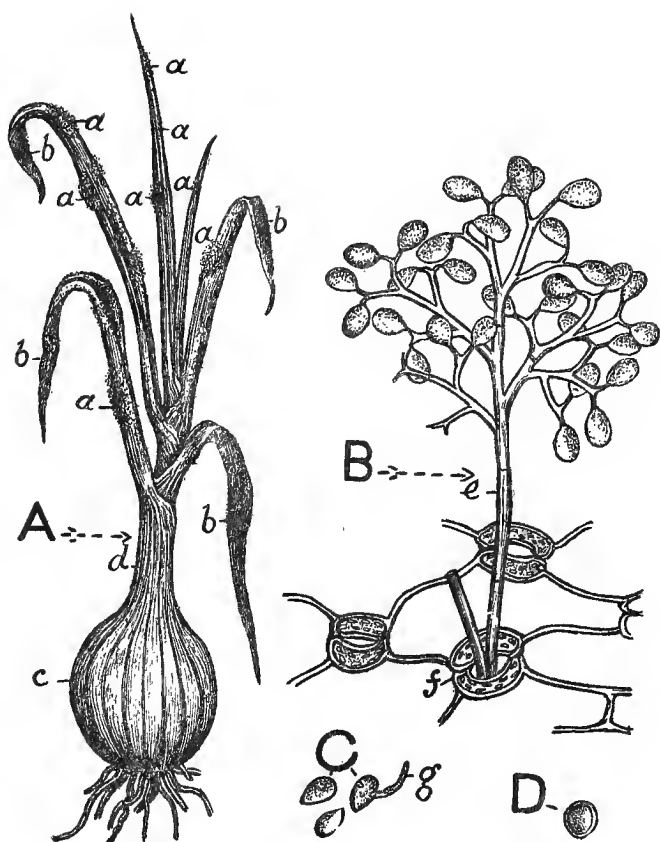
thicker wall than the conidia, are spherical rather than oval, and do not germinate until the spring following their production, when they inoculate the young Onions and start the disease anew.

Prevention.—The collecting and burning of all diseased tops in which the resting spores may pass the winter—as, if left on the ground they rot, and are set free in the soil—is imperative, for the resting spores retain their vitality for at least two years, hence Onions should not be grown on the same land more than once in three years. Where this is attended to the Onion crop cannot be affected as regards infection from the land.

Crops grown on low damp ground are more subject to attack than those in higher, drier and more open situations.

As the disease appears early, it has been advised to sow the seed in autumn so that the Onions are able to make a good strong growth before the appearance of the mildew in the spring following. This plan, however, does not secure absolute immunity from the disease ; besides, the bulbs of autumn-sown Onions do not keep through the winter nearly so well as spring-sown, and we have known autumn-sown Onion bulbs collapse entirely from mildew when they should have been maturing.

In the early stages of the disease it may be checked by dusting with a mixture of two parts quick lime and one part flowers of sulphur, applying by means of a bellows apparatus when the plants are damp. For



ONION MILDEW.

many years we have used a mixture of air-slaked lime and soot in equal parts by measure as soon as the young Onions were well up and again at thinning time, at the rate of a peck per rod, and not been troubled with mildew. Spraying with a solution of potassium sulphide, one ounce to two and a half gallons of water, will also check the spread of the disease. Prevention, however, rather than cure should be the aim of the cultivators.

THE ILLUSTRATIONS REPRESENT ONION MILDEW.

A, plant of Onion affected with Onion Mildew: *a*, diseased patches; *b*, portions of leaves destroyed and fallen back; *c*, bulb not affected; *d*, "thick" or long neck, one-third natural size. B, Onion Mildew (*Peronospora schleideni*): *e*, conidiophore bearing conidia or summer spores; *f*, stoma of Onion leaf. $\times 230$. C, mature and free conidia or summer spores, one germinating: *g*, germ-tube. $\times 200$. D, resting spore, or Oospore. $\times 300$.

PEA THRIPS (*Thrips pisivora*).

The Pea Thrips was first figured and described by Professor Westwood in the *Gardeners' Chronicle*, 14th August, 1880, page 206, and it is recorded that in July of that year the Pea crops in the neighbourhood of Oxford were seriously injured by the pest. Prior to that time, and since, the Pea crops have suffered more or less in hot and dry seasons from attacks of Thrips, particularly on dry soils and in warm situations; especially in 1893, and in 1896

and 1899, the Pea crops in Essex were practically spoiled by thrips.

In most cases of attack from Pea Thrips the haulm of the Peas is fully developed, but flowers and perfect pods are generally wanting, though a few abortive flowers, others with dried calyces and shrivelled petals, and pods with few or no peas in them, but distorted and prematurely dried, are not lacking. In numerous instances of Peas in fields and gardens whole rows of Pea plants are not unusually met with of average growth and apparent health, without perfect flowers and well-formed pods, while sometimes the crop is rendered utterly worthless. The insects causing this disturbance of flower development and pod formation are so minute as to be scarcely noticed by a casual observer, and if noticed regarded as too insignificant to cause such wholesale mischief.

The Pea Thrips is about one-twelfth of an inch long, greyish-yellow, without wings; antennæ seven-jointed, hairy, five upper joints yellowish and lower ones black. Eyes red, mouth furnished with a short fleshy sucking apparatus, feet shaped like bladders, and at the end of the body is a reddish-brown ovipositor. Winged specimens are sometimes found on Pea plants, darker in colour, with two pairs of wings with long fringes folded down the whole length, and extending beyond the body. The female places eggs of microscopic size close to the midribs of the leaves, from which the larvæ come in seven or eight days, and at once

begin to suck up the juices of the plant. There are many generations of the thrips during the summer. In the winter they remain relatively passive in the perfect state in the cracks and crevices of the bark of trees and similar sheltering positions.

Prevention.—As a rule the Pea plants are not attacked until coming into flower, and then, sheltered by the folded parts, the insects infest the foliage and fructifying portions, and often completely arrest the formation of flowers and pods. They seldom do any mischief till the flowering stage is reached. It follows that to prevent attack the steps taken must be antecedent to the flowering, the plants being sprayed with a wash, such as the following: (*a*) Take five or six pounds of soft soap and dissolve them in twelve gallons of hot soft or rain water, then add a gallon of strong tobacco liquid—that known as London juice—and spray on the plants during the evening of a fine day. The following morning wash the plants thoroughly with clear water, and in the course of a few days repeat the treatment, for though the first will destroy the insects it will not kill the eggs. (*b*) Place one ounce of strongest shag tobacco in a vessel and pour on it a quart of boiling water, cover closely and allow to stand until cool, then strain and sprinkle on the Pea plants with a fine-rose watering can. This is very serviceable to small growers, and it is easy to make any quantity for use on a large scale, repeating at weekly intervals until the Peas are well advanced in podding. (*c*) Boil five

pounds of quassia chips in five gallons of water, after steeping overnight, for half an hour, and dissolve in it as it cools five pounds of soft soap, diluting to one hundred gallons with hot water. Apply, when cool enough, by means of a knapsack machine, coating the plants in every part with the finest possible film of the liquid, repeating at weekly intervals once or twice.

Dusting with tobacco powder whilst the Pea plants are damp with dew has a good effect, repeating the dose occasionally. In the case of dry weather it will be advantageous to sprinkle the plants with water before dusting with the tobacco powder.

As Peas are most liable to thrips in hot and dry positions, it is good practice to mulch the ground on both sides of the Pea row with short partially decayed manure, and water the Peas liberally in dry weather, pouring the water on the mulching by the side of the rows. After the pods are formed or the flowering assured, a sprinkling of finely crushed nitrate of soda on both sides of the Pea row will help the plants, about an ounce being used per yard run of row. Syringing the plants overhead in the evening of hot days is very advantageous to the Peas, as though little will remain on the foliage, the ground is made moist and the atmosphere about by evaporation, water being very hateful to thrips, many being washed off by the syringing and not a few destroyed.

After an attack of Pea Thrips, Peas should not be sown the following year near the infected spot, and

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the ground should be deeply ploughed or dug, or, in gardens, trenched.

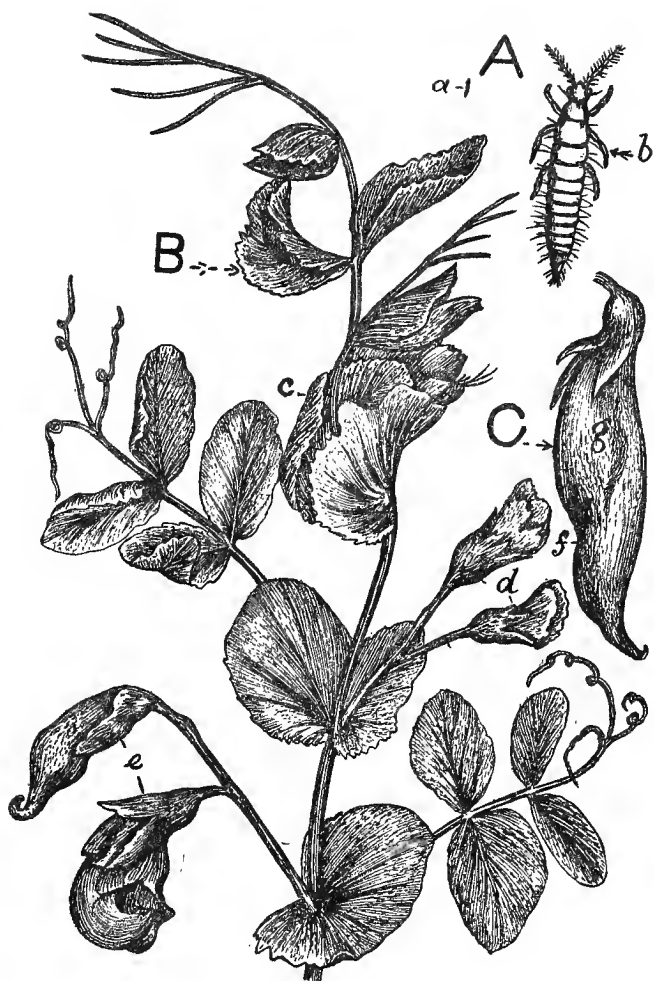
THE ILLUSTRATIONS REPRESENT PEA THIRPS AND EFFECT ON PEA PLANT.

A, Pea Thrips : *a*, natural size ; *b*, enlarged twelve diameters. B, portion of top of Pea plant infested with Pea Thrips : *c*, end of a shoot in which the leaves and flower buds are all shrivelled or dried up, checking further growth ; *d*, blooms completely crippled by the punctures of the thrips and incapable of development ; *e*, pods that have been formed, but contorted by the action of the thrips, and further growth arrested. C, pod partially developed : *f*, apical half shrivelled and contorted ; *g*, surface wrinkled by the punctures of the insects. The longest dots on the leaflets and other parts of the portion of top indicate the thrips.

BEAN AND PEA BEETLES (*Bruchus granarius* and *B. pisi*).

The Bean Beetle is a little more than one eighth of an inch long, colour black, with brown hairs and various white spots, tip of tail prolonged and covered with grey down ; head drooping, mouth forming a kind of wedge-shaped beak, wing-cases pitted with small dots, front legs reddish.

The Bean-seed Beetle lays its eggs on the young seed vessel in the Bean blossom, and from these eggs the maggots or larvæ hatch, and shortly eat their way into the growing Beans. Each maggot gnaws a gallery for itself and remains in the closed-up tunnel, turning, when full-fed, into a pupa, and thence into the beetle



PEA THRIPS.

state amid the dirt consequent on its feeding in the larval stage. From the caverns in the Beans the beetles do not come out till the end of winter, or, in some cases, well on in spring, though they have been found on Furze flowers as early as February, yet have been present in Beans in March, April and May.

Infected Beans are readily detected by having a little round depression in the skin, which is also, at this part, slightly yellowish or transparent. This is caused by the substance of the Bean having been eaten away inside by the fleshy, wrinkled, small, horny maggot, with a rusty-coloured head, which gnaws its gallery in the seed up to the skin, so that this sinks a little into the hollow space. When the beetle emerges it pushes the circular bit of skin off, and the small round holes show that the seed has been infected.

The Pea Beetle has a similar life history to the Bean Beetle, and is chiefly confined in attack to imported seed. Peas, however, are frequently infested by the Bean Beetle (*Bruchus granarius*), which also infests Broom, Furze and Vetches.

The effect of the Bean or Pea Beetle attack is to impair the vegetative power of the seed. Injured seed will sprout in most cases, but although the growing germ is left, a great part of what this germ needs to make it grow well is gone. As the young plant depends on the quantity of food in the seed for the vigour of its first start, being nourished by the substance turned into soluble plant-food by the chemical changes due to germination until the leaves and rootlets

are produced, it is evident that the chances of a strong and healthy plant are much diminished by using maggot-eaten seed. It follows, also, that if infested Beans or Peas are sown the beetles will not be injured by being buried, but will come up through the ground in due time to infest the new crop.

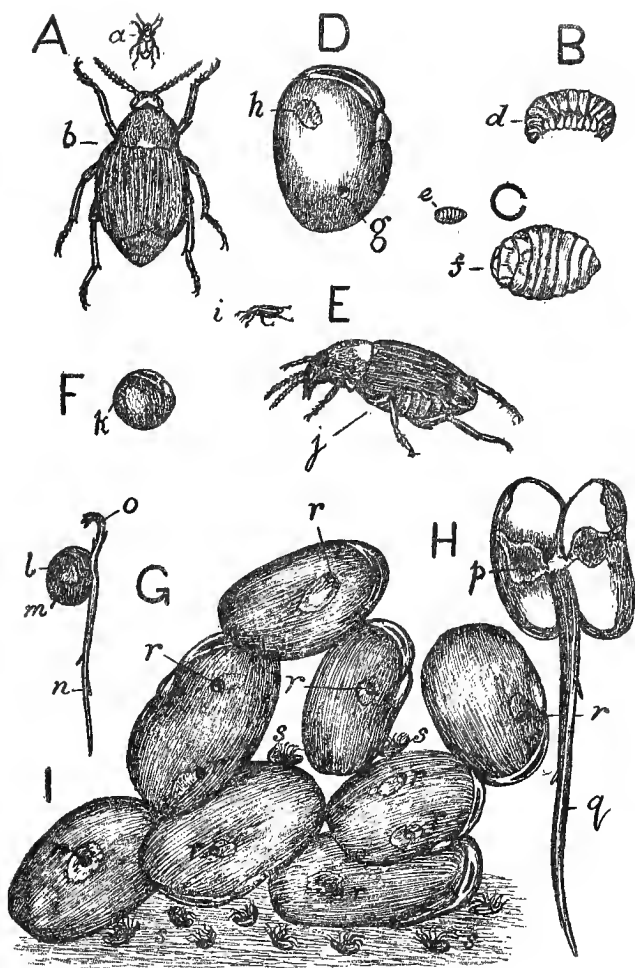
Prevention.—Whether the Beans or Peas are infested or otherwise they should be dressed with paraffin oil before sowing. In a large practice the writer has followed this plan for many years with complete success. The Beans or Peas are simply placed in a clean flower pot with the hole corked, paraffin oil sprinkled on and the seed shaken up, holding the pot by the rim with both hands and shaking up with a turn-over movement so as to bring the bottom seed to the top and *vice versa* and thus coating the seed all over with the paraffin oil. The surplus oil may then be run off by holding the hand over the seed and reversing the pot, either sowing at once or leaving overnight. If the latter, it will be seen what good the dressing has effected, if the beetles were in the seed they will have come out and be dead, or if they had escaped before the dressing the cavities will have been soaked with the oil and the Bean or Pea substance preserved against the attack of Snake Millipedes and other pests that are almost sure, otherwise, to be attracted by the exposed tissues and so, in conjunction with decay, destroy the substance that would be left intact, or, as remaining, go to nourish the young plant. Besides, the seed is protected from the attacks

of rats and mice, also other depredatory pests. On a large scale the seed may readily be coated with paraffin oil by placing in a vessel, sprinkling with the oil, and turning over a few times, so as to coat the seed in every part with the oil.

Treating the seed with a solution of carbolic acid, one pint of acid to six quarts of water, kills the beetles without hurting the seed. As a combined insecticide and fungicide the following recipe, taken from Miss E. A. Ormerod's *Manual of Injurious Insects*, p. 7, has been found effectual. Water, six quarts; blue vitriol, one pound; sewage carbolic, one pint. This dressing is for six bushels of Beans, sprinkling on and turning the Beans with a shovel. The liquid passes through the thin film of coating of the Bean or Pea at the end of the gallery and kills the beetle within.

THE ILLUSTRATIONS REPRESENT BEAN AND PEA BEETLES AND
INFESTED BEANS AND PEAS.

A, Bean Beetle : *a*, natural size ; *b*, magnified. B, Bean Beetle larva : *d*, magnified. C, Bean Beetle pupa : *e*, natural size ; *f*, magnified. D, Broad Bean infested with Bean Beetle : *g*, aperture from which beetle has passed out of Bean ; *h*, little round depression in skin of Bean, slightly yellowish and transparent, the Beetle being in gallery eaten away in Bean substance. E, Pea Beetle : *i*, natural size ; *j*, magnified. F, Pea infested with Pea Beetle : *k*, depressed spot in skin of Pea, the round spot being depressed, as also the area of the gallery, but skin intact, indicating presence of beetle in Pea, if open, the beetle has passed out. G, germinated Pea, the Pea having been treated with paraffin oil before sowing and the beetle killed, if coming out of the Pea : *l*,



BEAN AND PEA BEETLES.

aperture by which beetle has come out ; *m*, cavity soaked with paraffin oil and made offensive to Snake Millipedes and other pests ; *n*, radicle ; *o*, ascending axis or plumule. H, germination of Broad Bean that was infested with Bean Beetle when sown and seed not dressed : *p*, cavity formed by Beetle in Bean and ascending axis or plumule destroyed ; *q*, radicle quite normal, but the grower is disappointed because no growth appears above ground and the seed lobes are generally infested by millipedes and rapidly decay. I, infested Broad Beans after treatment with paraffin oil and remaining overnight : *r*, small holes by which beetles have passed out of Beans ; *s*, dead beetles.

THE POTATO DISEASE (*Phytophthora infestans*).

This destructive pest was first observed in the United States, Denmark and Norway between 1840-42, and by 1845 it had spread over Europe, doing immense damage, especially in Ireland. In the first ten years of its invasion the injury was very severe, and though less malignant at the present day, it is still the cause of much damage, particularly in wet seasons. It not only attacks the Potato and Tomato, but infests several exotic and native species of *Solanum*.

History.—The disease is first indicated by brownish blotches on the leaves. These, small at first, gradually increase in size and cause the leaves to curl, followed by a blackening and decaying of the leaves and stems, the affected crop collapsing in a few days and emitting a disagreeable smell in cases of severe infection. With a pocket lens numbers of delicate white threads are seen towards the circumference of the diseased and brown

spot on the under side of the leaf. With a microscope these threads are found to consist of simple or branched conidiophores emerging singly or in clusters through the stomata of the leaf, and bearing conidia or spores, egg-shaped and colourless. The conidia produced on the conidiophores which originate from the mycelium of the fungus ramifying the tissues of the leaf, are thus in a position, when mature, for ready dispersal by wind, rain and other natural agents. A conidium thus dispersed may germinate at once, pushing a germ-tube, or it may give origin to a number of zoospores when alighting on a damp surface, as that of a Potato leaf covered with water from rain or even dew. The zoospores, furnished with hair-like appendages, move about actively for some time in the water, and finally settle down and emit a germ-tube, which enters the tissue of the leaf through a stoma or directly bores through the epidermis.

Conidia washed by rain upon young tubers produce zoospores which infect the Potatoes, entering their tissues, forming a mycelium and setting up decay, more or less, unless, as it has been found to happen frequently, "sweating" takes place after the Potatoes are stored, when the mycelium spreads and converts the mass, often aided by other micro-organisms, into an ill-smelling state of putrefaction. Thus the fungus may wear itself out, or be subdued by other organisms more speedily resolving organic into inorganic matter. But the mycelium of the fungus also passes down diseased Potato stems, infects the tubers, and the

mycelium in part becomes latent until the following season, when it may renew its activity and grow up along with the stems springing from the tuber, giving rise to the disease known as "curl," and the spores of the fungus being produced the disease rapidly spreads over a whole field, parish, county, or country.

The sexual mode of reproduction is not developed in *Phytophthora infestans*, hence there are no resting spores or oosphores, and consequently the only means of re-infection is from reproductive bodies originated from latent mycelium.

Prevention.—1. Burn all the tops after the crop is gathered, as the mycelium may hibernate in them, especially in axillary tubers not unfrequently produced on the stems. 2. Gather all small and diseased Potatoes, as the mycelium hibernates in them, and, surviving the winter in the ground, may start the disease anew. 3. Select seed for planting from localities exempt from disease in previous season, always exercising great care in selecting seed, preferably from a different soil, never using other than sound sets, for diseased tubers are the principal means of infection. 4. Rotate the crop, for the means of infection certainly survive in the Potatoes and stems left in the ground. 5. Thoroughly work the land, having it in good tilth and perfectly clean. 6. Plant early in the season, early or second early varieties in March, and all in April, the earlier the better as befits variety and location, for the plants acquire a better disease-resisting habit. If manure be used at time of planting let it be

thoroughly rotted, for rank manure induces a gross and late growth highly favourable to attack by the fungus.

7. Plant on a sandy loam, or a well-drained soil, as the moisture of a heavy or badly drained soil favours the disease. 8. Use whole sets about two ounces in weight or if cut seed is used the surface should be allowed to dry or preferably be dusted with quick lime. 9. Select varieties least subject to the attack of the disease. 10. Choose a time for planting when the ground is in good working order, allow due space for the development of the plants, as sturdiness of habit induced by due exposure to light and air implies corresponding disease-resisting power ; also supplement the stable or farmyard manure application by a dressing of artificial manure tending to promote sturdy growth and early maturity of crop, always avoiding rank manure and chemicals that induce gross and late growth. 11. Cover the seed four inches deep and never exceed six inches. Keep the ground clean and in due course earth up the plants well, not only to prevent the greening of the tubers, but also to safeguard them from infection by conidia of the fungus washed into the soil by rain. 12. Spray the plants with Bordeaux mixture or Bouille Bordelaise, early kinds during the last fortnight of June and other varieties during the first fortnight of July.

Repeat the spraying a fortnight or three weeks after the first application. As a rule the first dressing of Bordeaux mixture may be made after the plants are earthed up and about one-third grown or before the plants meet in the rows, and the second in about a fort-

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night or by the time the plants are showing or coming into flower. For general crops one application should be made towards the end of June and another towards the end of July. The effect of the spraying is to (1) prevent infection to a great extent, if not entirely ; (2) render the plants more impervious to the attacks of the fungus where it has made its appearance ; and (3) arrest the disease in a considerable degree after the plants show signs of the infection. Thus the plants remain longer in growth and yield a heavier crop of better-matured tubers and freer from disease than would otherwise be the case.

The Bouille Bordelaise has the following composition :—

Sulphate of copper	20 lb.
Lime unslaked	20 lb.
Water	100 gallons.

The sulphate of copper is dissolved in a tub containing about twenty-five gallons of water, being first placed in a bag of coarse sacking suspended over the edge. The lime is slaked in another vessel, and after forming into a paste free from grit and small lumps, add sufficient water to make up twenty-five gallons. When the copper sulphate is entirely dissolved and the lime is *cool* pour the lime milk and copper solution slowly together, stirring the milk of lime well before pouring out. Add the remainder of the water and stir with a broad wooden paddle for at least three minutes and the mixture is ready for use.

About 100 to 120 gallons of the mixture are necessary for a first dressing, and from 120 to 160 gallons for a second dressing per acre. With the knapsack sprayers, Eclair or Antipest, a man can dress about half an acre per day. The cost of dressing is from eight shillings to ten shillings per acre, depending upon the price of labour and the quantity of Bouille used for each application.

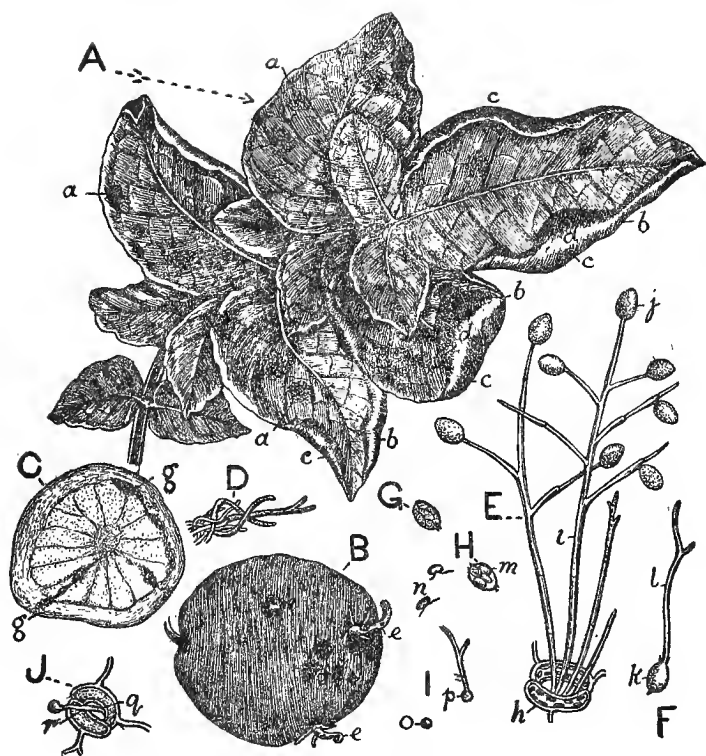
Affected crops not dressed with Bordeaux mixture should be dug up as soon as the skins are sufficiently set, as the disease spreads rapidly to the tubers, especially if the weather be wet.

Thoroughly dry the Potatoes before storing them. Those for seed may be "greened" by exposure to light; but those for use as food must be kept dark. If stored when wet the spores lodging in them will germinate and develop the disease, whilst the affected tubers speedily decay.

Store in a cool dry place and sort the tubers occasionally, removing infected ones, and dusting in case of infection with dry air-slaked lime at the rate of one bushel of lime to twenty-five bushels of Potatoes.

THE ILLUSTRATIONS REPRESENT THE POTATO DISEASE (PHYTOPHTHORA INFESTANS).

A, diseased leaf: *a*, small brownish blotches; *b*, curled leaflets; *c*, blackened and decayed portions; *d*, whitish mould. B, set: *e*, apparently healthy sprouts; *f*, sprouts retarded in growth and slight depressed blotches on skin. C, section of set: *g*, browned tissue. D, portion of mycelial hyphæ (mycelium) from browned tissue. E, cluster of conidiophores:



POTATO DISEASE.

h, stoma of Potato leaf ; *i*, conidiophore ; *j*, conidium. *F*, a free conidium germinating ; *k*, conidium (spore) ; *l*, germ-tube. *G*, a free conidium with contents breaking up into zoospores. *H*, a conidium germinating and liberating zoospores : *m*, conidium ; *n*, free zoospores with cilia (hairs). *I*, zoospore become passive and germinating : *o*, passive ; *p*, germinating. *J*, zoospore germinated and germ-tube entered Potato leaf through stoma ; *q*, stoma ; *r*, germ-tube. *A-C*, two-thirds natural size. *D-J*, enlarged two hundred and fifty diameters.

POTATO SCAB.

This affection on the skin of Potatoes may be due to different agents. There are at least three forms found on Potatoes.

1. Scab not caused by parasitic organisms. The brownish scale on the skin and cracking in the bark of Potatoes, often forming large rough patches and seriously affecting their market value, begins at a very early stage of growth in the tuber. Both are seen at first as small corroded spots, or minute open pustules. In bad cases the spots and cracks become confluent, and the whole skin or bark of the Potato is unsightly. If the weather be dry, the tubers are not injured more than the waste of substance for use, indeed, the so-called dry-scab is a sure indication that the Potato attacked is good and floury, though the market value is depreciated in ratio to the degree of scab. When the weather proves wet and the inner portion of the tuber is exposed, as in scab, to the soil, affected Potatoes acquire an earthy and disagreeable

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taste, decay setting in, and the devastation is accelerated by the action of minute animal and vegetable pests, never slow to take advantage of feeding on exposed vegetable tissues, hence scabbed and cracked Potatoes are often wholly unfit for human food and not marketable.

This brownish scab and cracking are due to the presence of some irritating or corrosive substance in the soil. Lime rubbish, builders' refuse, ash-pit manure or ashes, and the use of highly nitrogenous manures, such as fowl and pigeon manure placed in direct contact with the sets and thus ready for the young tubers to come into contact with, also rank stable or farmyard manure used at the time of setting below or over the sets, are likely to cause the scabbing and cracking of Potatoes. Continued drought when such substances are used may extend the action in a corrosive direction. The tuber strives to repair the injured part, the bark becomes scabbed and cracked, and insects and fungi take possession.

It generally happens that a portion only of a crop of Potatoes is scabbed, and this can often be traced to a part of the garden or field where irritating or corrosive substances have been applied. When scab and cracking can thus be traced the remedy suggests itself.

Potato Scab or Smut (*Sorosporium scabies*) produces one form of scab in Potatoes. It grows beneath the skin of the tuber, where it forms a thin, dark, greenish-brown stratum, often extending over the

greater part of the external surface of the tuber. The presence of the fungus may be detected by discoloured blotches on the skin. It often happens that no trace of the disease is to be seen at the time of harvesting, but it frequently shows itself during winter in stored Potatoes, small discoloured spots first appearing on the skin of the tuber. These spots increase in size and become confluent, till at length the entire surface of the potato is discoloured. The cuticle then bursts in many places, and the olive-green spores are set free.

Prevention.—Scab may generally be prevented by adding lime to the soil, either in the autumn or early in spring, and avoiding the use of rank manure at the time of planting. A hundredweight of quick lime per rod is a proper quantity to apply, slaking in little heaps convenient for spreading, and digging or ploughing in as soon afterwards as convenient, always choosing a dry time for the operation. If manure is applied in autumn the liming may be performed in March. In the case of land previously heavily manured it is well to omit manuring altogether, relying upon the liming and the application of artificial fertilisers. When the land is limed in autumn thoroughly rotted stable or farmyard manure may be applied in spring.

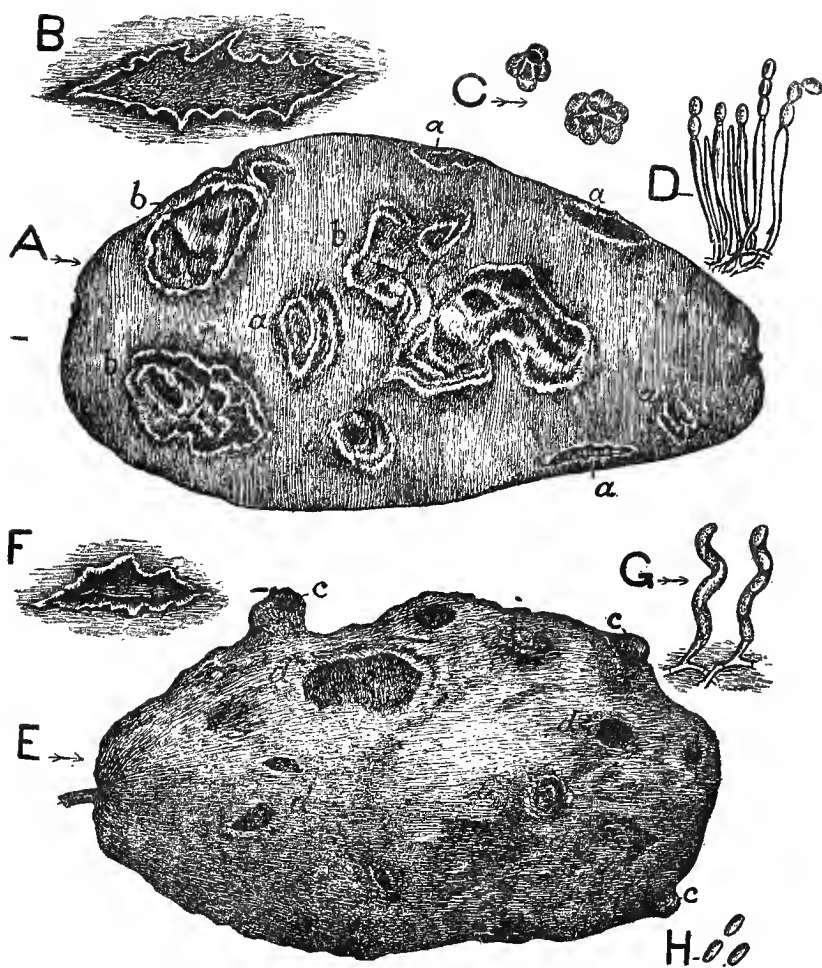
No Potatoes showing traces of scab should be planted, and when the disease appears among stored tubers the whole should be sorted and the sound ones freely dusted with air-slaked lime before again storing. When *Sporosporium* disease in the Potatoes is suspected

in the tubers selected for seed they should be steeped in a solution of half a pint of formalin and fifteen gallons of water for two hours, which, according to Professor Arther, is a complete specific for American Potato Scab, though this has nothing in common with Potato Scab as understood in the British Islands. Formalin, however, is a poison, and must only be used for sets.

AMERICAN POTATO SCAB (*Oospora scabies*).

This troublesome disease has only been thoroughly investigated in America. It usually attacks the tubers while young, forming rough patches known as scab on the skin. The fungus causes a deep black-brown discolouration of the substratum, and frequently the affected tubers produce abnormal growths or swellings similar to super-tubering. When the tubers are freshly dug up a delicate greyish mould is present on the diseased patches, but these fine whitish threads soon dry up and disappear when exposed to the atmosphere. It reproduces itself by means of spores, which remain in the soil for some years, and not only infect Potatoes, but Beet, Carrots, Swede Turnips and Cabbages.

Prevention.—Destroy all diseased tubers by burning, or if fed to stock boil them before use. Land which has produced scabbed crops, either of Potatoes or Beets, must not be planted with Potatoes in the following year. Avoid the use of rank stable or farm-



POTATO SCAB.

yard manure, as this particular scab is most prevalent where the land has been heavily manured. Use a dressing of lime and any approved artificial fertiliser in preference to stable or farmyard manure. The seed must be free from oospore spores, or be treated with the following as advised by Professor Bolley :—

Immerse the Potatoes, after placing in a sack of open texture, for an hour and a half in a solution consisting of two and a quarter ounces of corrosive sublimate to fifteen gallons of water, after which they may be cut and planted as usual after being spread out to dry. The corrosive sublimate should first be dissolved in a few gallons of hot water, placing the solution in a wooden vessel, as the mixture corrodes metal. The solution is a strong poison, but does not work injury unless taken into the stomach. Great care should be taken in handling the pure substance and all treated Potatoes must be planted.

THE ILLUSTRATIONS SHOW POTATO SCAB.

- A, Ashleaf Kidney Potato affected by ordinary scab fungus (*Sorosporium scabies*) : *a*, small scabs called sori or seats of fungus growth ; *b*, large scab in rough patches, often due to mechanical agency and not always caused by parasites. B, sorus (or scab on Potato skin) of *Sorosporium scabies* in early stage. $\times 3$. C, spores of Potato scab fungus (*Sorosporium scabies*). $\times 300$. D, *Periola tomentosa*, a fungus found on scabbed Potatoes in stores. $\times 300$. E, Potato affected by American Potato scab (*Oospora scabies*) : *c*, swellings caused by fungus ; *d*, scabs. F, early stage of *Oospora scabies* sorus. $\times 3$. G, aerial hyphæ and conidia of *Oospora scabies*. $\times 300$. H, spores of *Oospora scabies*. $\times 300$.

SLEEPING DISEASE OF TOMATO (*Fusarium lycopersici*).

Sleeping Disease of Tomato was first recorded from the Channel Islands. It is very destructive to the crops of Tomatoes extensively grown in Guernsey. In recent years the disease has occurred in most localities in the British Islands, even where widely separated, where both small and large areas are under cultivation, considerable loss resulting to the growers.

The plants affected by sleeping disease first give indications of attack by the dull or leaden colour of the foliage, and presently the leaves begin to droop. Shortly afterwards the stem collapses, especially at the lower part, and the plant goes off altogether, as indicated in the illustration at A, p. 266. Sometimes, however, the affected plant makes a great effort to supply itself with nourishment by pushing adventitious roots from the stem above ground, and in some instances a surface dressing of soil placed round the stem has resulted in the maturing of the fruit already set and swelling on the plant. A case of this kind is shown at B, p. 266.

The attack on the Tomato plant is more frequent after fruit is present than before, though the parasite assails the seedlings, and in all stages of growth, but usually its effects are not pronounced until the flowering and fruiting stages. It frequently happens that the plants are not apparently attacked until they are well in fruit, and this very often ripens, the unaided eye and even microscopical examination failing to

detect any trace of the disease, even in the stem of the plant, for any considerable distance above ground. Thus the disease appears to have degrees of virulence or the plants possess varying resistive power.

History.—In all cases the root is attacked first. The fungus gains entrance to the plant through the rootlets, often by the radicle or tap-root, and gradually extends to the root-stem. Its mycelium ascends in the woody tissues of the root-stem, and presently the plant begins to droop or “sleep”. If a stem is cut through just above ground at this stage, drooping being well pronounced, a brown discolouration of the woody tissues or vascular bundles will be noticed clearly by the naked eye, and this is a certain indication that the disease has extended so far up the stem. Shortly after this the cortex or bark at the junction of the stem with the soil becomes brown, and presently is more or less covered with a very delicate white mould. This consists of the first stage of the fungus, being fruiting branches or conidiophores, and bearing conidia in whorls, shown at E, p. 266. This *Diplocladium* stage of the fungus is quickly followed by the *Fusarium* condition, which forms from the same mycelium that previously produced the *Diplocladium*. The *Fusarium* stage is shown at F, p. 266. Another form of fruit is produced on strands of mycelium in the soil, which are termed resting spores because they remain dormant for a season and then germinate. These bodies are shown at G, p. 266.

The first stage spores fall to the ground when mature. They germinate and produce a mycelium

that may attack the roots of Tomato plants. In like manner the second stage spores drop to the earth when ripe. They quickly germinate and the mycelium produced may attack the rootlets of Tomatoes. On these points, however, the data are not decisive. Of the third stage or resting spores there is no question of their capability of infection. They are formed in the soil, remain dormant there for a season and then germinate, forming a mycelium, probably at first saprophytic, capable of attacking the rootlets of Tomatoes, and by this means the disease is continued from year to year.

In no instance has success attended efforts to infect above-ground portions of Tomato plants with either *Diplocladium lycopersici* or *Fusarium lycopersici* spores. This is remarkable, and as the young rootlets of the Tomato are the only part of the plant through which the fungus gains admission to its interior, the deduction may be drawn of the fungus beginning life as a saprophyte and of even mainly leading that, though also capable of becoming parasitic.

Prevention.—As the disease is wholly internal and infection on the aërial part of the plant not feasible, spraying with fungicides is worse than useless. As the fungus begins life as a saprophyte, it is obvious that the best preventive will be to avoid green manure, either as an application to the soil or as a top dressing, for a saprophyte must have at command dead and decaying organic substance to exist. The manure, or such substances as leaf mould and even turfy loam, with

the vegetation only partially decayed, may not contain spores, yet afford a congenial means for those present in the ground to germinate and reproduce themselves. Hence when seeds or plants push rootlets the mycelium of the fungus may assume its parasitic proclivities. The use of quick lime also tends to resolve the decaying animal and vegetable matter in the soil into inorganic substances upon which no saprophyte can live, hence to take away the food is to exhaust the organism. Whether lime acts on fungus in that way or directly destroys its saprophytic existence is not clear, but that its application reduces infection to a minimum is beyond question.

Another matter worth notice is that plants grown in pots are far less liable to sleeping disease than those planted in the border upon which the pots are placed. In the cultivation of plants in pots the compost mainly consists of loam in which the organic substances are in a complete state of decay, and fertilisers employed which only green-leaved plants can make use of. The fungus, therefore, even if present, cannot exist, or if the spores germinate the mycelium has its career ended in the saprophytic stage.

As preventive the use of quick lime is strongly advised at the rate of one pound per square yard, slaking with the smallest amount of water necessary to cause it to fall into an apparently dry powder, then spreading evenly whilst hot and in the course of a day or two digging in with a fork and taking small spits so as to mix as evenly as possible with the soil to the

depth of a foot. This should be done about six weeks in advance of planting or the application may be made in autumn. In the case of soil for potting, air-slaked lime mixed with an equal proportion of soot by measure may be used at the rate of one per cent. Where pots are to be placed the ground should be well dressed with quick lime.

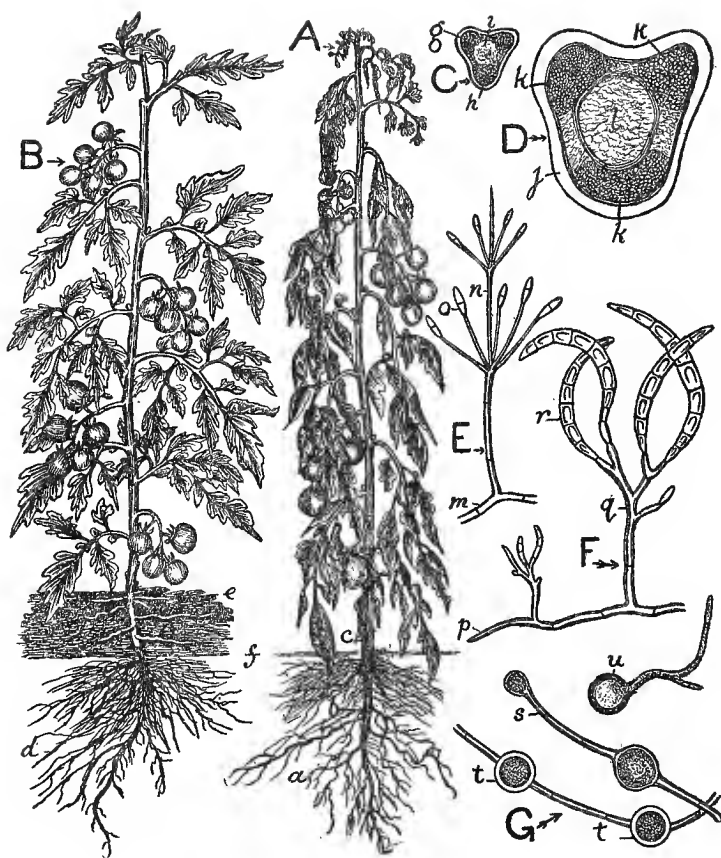
The use of basic cinder phosphate has also been tried advantageously, especially with kainit: two pounds of basic cinder phosphate and three quarters of a pound of kainit per square yard, digging on in the autumn and forking over again before planting. In the case of soil for potting, the mixture may be added to about nine cubic feet, or spread the compost about a foot in depth and sprinkle on it the two and three quarter pounds of mixture per square yard and mix well.

Though the disease has not been traced to the seed, it is not wise to use that obtained from diseased plants, and even that from a neighbourhood where the disease prevails cannot be safely used, for apart from germs there is greater susceptibility to disease.

It is needless to insist that the plants should be removed and burned on the appearance of the first symptoms of the disease, and the soil dressed and thoroughly mixed with quick lime.

THE ILLUSTRATIONS REPRESENT SLEEPING DISEASE OF TOMATO.

A, plant of Tomato drooping and destroyed by Sleeping Disease :
a, roots brown and dead ; *b*, root-stem browned and destroyed ;
c, stem up which disease passes. B, recuperated plant of



TOMATO SLEEPING DISEASE.

Tomato by top dressing with soil, sometimes effective in enabling plant to mature fruit : *d*, roots and root-stem destroyed by Sleeping Disease to ground level ; *e*, top dressing of soil encouraged rooting from aerial part of stem ; *f*, ground level. C, transverse (across stem) section of drooping plant (A) just above ground, natural size : *g*, vertical tissues apparently healthy ; *h*, woody fibres brown and diseased ; *i*, pith cells, quite normal. D, section of stem of diseased plant (A) just above ground, enlarged three diameters : *j*, healthy vertical or bark cells ; *k*, woody fibres diseased (brown) ; *l*, normal (white) pith cells. E, early or first stage of fungus, called *Diplocadium* stage : *m*, mycelium or prostrate hypha ; *n*, conidiophore ; *o*, conidium or spore. $\times 300$. F, second stage of fungus, termed *Fusarium* stage : *p*, mycelial thread or prostrate hypha ; *q*, conidiophore ; *r*, conidia or spores. $\times 300$. G, final or resting stage of fungus : *s*, mycelial thread with spores in course of development ; *t*, matured resting spores ; *u*, resting spore germinated and pushed germ-tube. $\times 300$.

TOMATO BLACK SPOT (*Macrosporium tomato*).

The disease known as "black spot" or rot, also as "black stripe" or blotch, spreads easily, being more or less present wherever the Tomato is cultivated. It is caused by the parasitic fungus named *Macrosporium tomato*, but is closely allied to, if not the same as, the Potato Leaf Curl fungus, *M. solani*. The fruit is most frequently attacked, but the fungus is also often present on the stem, producing the well-known "black stripe," and on the leaves, causing the condition termed "curl".

The fungus has been regarded as a wound-parasite, and thus gets into the tissues of the Tomato plant

through minute cracks in the cuticle or skin. This is emphasised by the fact that the fruit is usually affected round the style, or at the point of insertion of the stem, where minute cracks frequently occur. The fungus, however, appears on any part of the fruit, and also on any portion of the stem and leaves. It appears that the chief seats of disease are where moisture has rested in the parts some time, and the germ-tube of a spore of the fungus being present, may either have entered by a minute crack in the cuticular cells or directly pierced through the softened cuticle.

The affected part has, at first, a white blister-like appearance, as if due to scorching or scalding, and is a little below the general surface of the healthy part of the stem, leaves or fruit. As the dark-coloured mycelium of the fungus forms in the tissues, the diseased spot assumes a dark or black colour, for the parasite rapidly destroys the cells, and consequently the affected part sinks, forming a depressed blotch, spot or stripe. Later, the sunken surface becomes covered with a delicate velvety pile, in places, of a brownish or blackish-olive colour. This outgrowth is, under microscopic examination, found to consist of closely packed, dark-coloured conidiophores, each bearing a dark, many-celled conidium at its tip. The conidia, when mature, germinate quickly in water, each cell or spore producing a germ-tube capable of infecting a Tomato if placed on a surface susceptible to entrance.

Prevention.—All diseased parts should be cleared away and burned, otherwise the “fruits” of the fungus

continue to be produced on shrivelled fruit, stems and leaves. Besides, the spores persist through the winter on fragments of stems, leaves and fruit, hence to prevent a repetition of the disease the tops or whole plant should be carefully collected and burnt. Seed should not be saved from diseased fruit or even from apparently healthy plants in the immediate neighbourhood of any disease. As there is danger of mycelium becoming latent in the seed all the seeds with a dark spot or stain in them should be rejected, only retaining those that are sound and clear.

In the matter of cultivation avoid forcing treatment such as the use of fresh or green stable or farm-yard manure, which has a tendency to induce gross growth and cause the stems, leaf-stalks and fruit to crack. Do not maintain a close and moist atmosphere, and admit air early to dissipate moisture which is deposited on the cooler surfaces of the plant, as this favours the germination of the fungus spores. Keeping the atmosphere arid and restricting the supplies of water for a time, and then returning to genial atmospheric conditions will with generous feeding at the roots result in cracking and render the plants very susceptible to attack. Indeed, immunity rests mainly upon a free atmosphere without extremes of heat and cold, moisture and dryness. Prevent moisture condensing on fruit and do not allow water to rest upon it for any length of time.

Thorough spraying with potassium sulphide, one ounce to two and a half gallons of water, at frequent

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intervals, prevents attack from and spread of the disease. The potassium sulphide, popularly known as liver of sulphur, should be dissolved in a quart of hot water, then made up to two and a half gallons with cold water.

Ammoniacal carbonate of copper solution may also be used as a preventive, and being a clear liquid does not stain the fruit. Its formula is :—

Water.	9 gallons.
Aqua ammonia (26° strength)	12 fluid ounces.
Copper carbonate .	1 ounce.

Form the copper carbonate into a thin paste with six fluid ounces of water, add the ammonia water slowly, and to the deep blue clear solution thus obtained add the water and stir well. It is sufficient in spraying to coat the plant with the finest possible film of the solution, and not to use it after the fruit has developed to three quarters its proper size.

THE ILLUSTRATIONS REPRESENT TOMATO BLACK SPOT.

A, affected Tomato plant : *a*, in setting fruit causing it to turn black ; *b*, attacked stem called "black stripe," the mark running in line of stem ; *c*, stripe on petiole of leaf, which also occurs on midribs and veins of leaflets ; *d*, leaflets affected with "curl" and producing brown or blackish blotches ; *e*, black stripe on young fruit ; *f*, attack in ribs of fruit called "black stripe" ; *g*, fruit attacked at eye ; *h*, fruit infested at heel ; *i*, fruit attacked on side ; *j*, black stripe more advanced ; *k*, black blotch more developed ; *l*, black spot more characterised. B, fruit affected with "black stripe" and "spot" : *m*, "black stripe" ; *n*, "black spot". C, fruit affected at eye with blotch



TOMATO BLACK SPOT.

in early stage, then resembling a blister, but depressed : *o*, blotch. D, fruit affected with black spot in an advanced stage : *p*, black spot. E, Black Spot fungus (*Macrosporium tomato*) : *q*, conidia in various stages of development. $\times 300$. F, detached conidia of *Macrosporium tomato*, one germinating : *r*, germ tube.

TURNIP "FLY" OR "FLEA" (*Phyllotreta nemorum*).

The Turnip Fly or Flea is a small beetle (A, p. 278), about one and a quarter line long ; black, with a broad yellow stripe down each wing-case (elytra). The antennæ have three joints near the head, ochreous, and eight dark-coloured joints. Legs ochreous, thighs stout, hence well adapted for jumping ; it often takes leaps of twelve to eighteen inches. It has also large and powerful wings (A, *c*) over a quarter of an inch in expanse, therefore capable of long flights, undoubtedly smelling its food from a distance. It attacks the young Turnips and other Brassicas, biting and devouring their soft tissues, and lays eggs on the second or rough leaves (B), choosing the under side. From the eggs minute yellow grubs or larvæ hatch out in seven or eight days (C), and make mines (D) in the leaves, feeding upon the soft tissues and correspondingly injuring the plants. The grubs or larvæ are, when full grown, about two and a half lines long, with three pairs of feet and a caudal "sucker foot," and have dark marks upon the anterior and posterior parts of their bodies. In the course of five to seven days they fall to the ground and change to pupæ (E),

from which, in about twelve days, the perfect beetles come and proceed to attack the Turnip or other Brassica plants. In dry and hot seasons or under suitable conditions for increase as many as six generations may be produced during the summer.

The Turnip Fly thrives in dry, dusty and cloddy soil, and in a dry summer causes much harm to Turnip plants as they cannot grow away from its attacks. Directly the leaves come from the seeds, the young plants are eaten or riddled with holes (G, p. 278) and can make no further progress, or, if they continue to grow, they are often so weakened as to be practically worthless. In times of drought irretrievable mischief is done, sowing after sowing being cleared off by the beetles in rapid succession. The main and most dangerous attack is when the plants are just starting and until they are fairly in "rough leaf," yet when the weather proves dry after the plants are in second leaf, the tops are often so much bitten by the beetles and the mining of the larvæ that the plants do not make good roots. Even when roots are formed and are of some size, late generations of beetles stick to them, in some seasons to the end of September. The flea beetle not only attacks Turnips and Swedes, but is often very destructive to Rape, Mustard, Kohl-rabi, Cabbage and other Brassicas, or cultivated Cruciferous plants. It also lives on such weeds as Charlock, Shepherd's Purse, and Jack-by-the-Hedge.

Two other species of flea beetles are more or less injurious to Turnips and other plants of the same

natural order. Of these, *Phyllotreta undulata* is the most common, being rather smaller than *P. nemorum*, and the stripes on the wing-cases are somewhat differently arranged. *Phyllotreta concinna* is the next common, being brass coloured. Other species have also been noticed as feeding on seedling Turnips, one kind being black and dark blue above, and another bright blue above and not so black beneath. All are alike in their mode of life and manner of doing harm and all must be combated.

During winter the Turnip Flea beetles harbour under bark and other material connected with hedge-rows and their plants, amongst fallen leaves, under clods of earth, stubble, in heaps of collected weeds and long strawy manure, whence they come out in fine days to "sun" themselves. On the return of spring and the bursting forth of vegetation into renewed life, and till the cultivated crops are ready for them they are to be found feeding on such common Cruciferous plants as Charlock, Shepherd's Purse, and Jack-by-the-Hedge, and from these pass to the better "feed" of cultivated crops of the same order by great leaps and swift flights.

Prevention.—1. As wild Cruciferous plants, especially Charlock, encourage the flea beetles and furnish them with food until the Turnip or other crops are sown and ready for them in gardens and fields, it is important that the weeds be kept down.

2. Provide a fine tilth or seed-bed, as the "flies" are most destructive on cloddy soil; besides, they do not like moisture, which naturally helps the young

plants to grow away from their foes, and it is well known that moisture evaporates more quickly from land that is cloddy, or rough, than from well-tilled soil.

3. Rolling down the land, or, in the case of very small plots, beating with the back of a spade, after the drill or sowing should be adopted, as this keeps in moisture and levels the soil, enabling the plants to grow away as quickly as possible. Artificial manure mixed with well-powdered ashes, or mould, should be drilled in, or placed in the drills with the seed, so that it may be close to the plants to help them to grow away as quickly as possible from the onslaught of the beetles. The ashes and mould should be moistened. Putting in Turnip seed with a water drill has certain advantages, but the objection is that the moisture soon evaporates and in case of drought the seed germinated quickly is checked or the plants are lost. In small plots watering the drills or, if broadcasted, the ground before sowing, can be practised successfully; only continue the watering after the plants appear if the weather prove dry.

4. Plenty of seed of the preceding year's harvest should be used, but always examined or guaranteed as to its germinating powers and as to its freedom from other seeds. This is a point that can hardly be insisted upon too strongly. Sowing Mustard seed with Turnip seed sometimes saves Turnip plants from serious injury, as it germinates more quickly, and the beetles feed on the Mustard plants instead of the Turnips, when the weather favours the latter, for the

beetles are just as fond of Turnip as of Mustard seedlings, though attacking the latter because they come up first. In dry seasons the Mustard seedling has little value, as the beetles are rather fostered than otherwise by the Mustard, the generations of beetles following rapidly.

Remedies.—1. Very finely powdered lime sprinkled on the plants when coming up and whilst damp with dew is the oldest and most serviceable dressing when persisted in at intervals. The writer used this for over half a century and found it effective on fine tilth.

2. Dressings of soot, sprinkled on the plants when the dew is on them, are of service. Soot and lime, one bushel of soot and two bushels of lime mixed, also form a useful dressing, applying it when the dew is on the plants. More effective, but less useful to the Turnips, is a dressing of wood ashes, or peat moss, finely powdered and moistened with half a gallon of paraffin oil per cwt. It should be distributed very lightly over the plants. A mixture of air-slaked lime and gas lime fresh from gasworks in equal parts, with five pounds flowers of sulphur added to each bushel of the mixture and well mixed, has been used to advantage. All the above dry substances can be put in by horse distributors evenly and in small quantities without water, and on a small scale by hand-worked bellows apparatus.

3. Paraffin oil distributed by horse or hand distributors in very small quantities, so that each leaf is sprinkled and made distasteful to the beetles. These

"oiled" preparations act well, but must be used very carefully as an overdose is as bad as the beetles, or worse. Carbolic acid may be distributed in the same way in very minute quantities, the acid being diluted to a safe strength which must be first ascertained by experiment. Quassia extract mixed with soft soap and water is a safe and serviceable dressing. Merely coat the plants with the finest possible film of the solution.

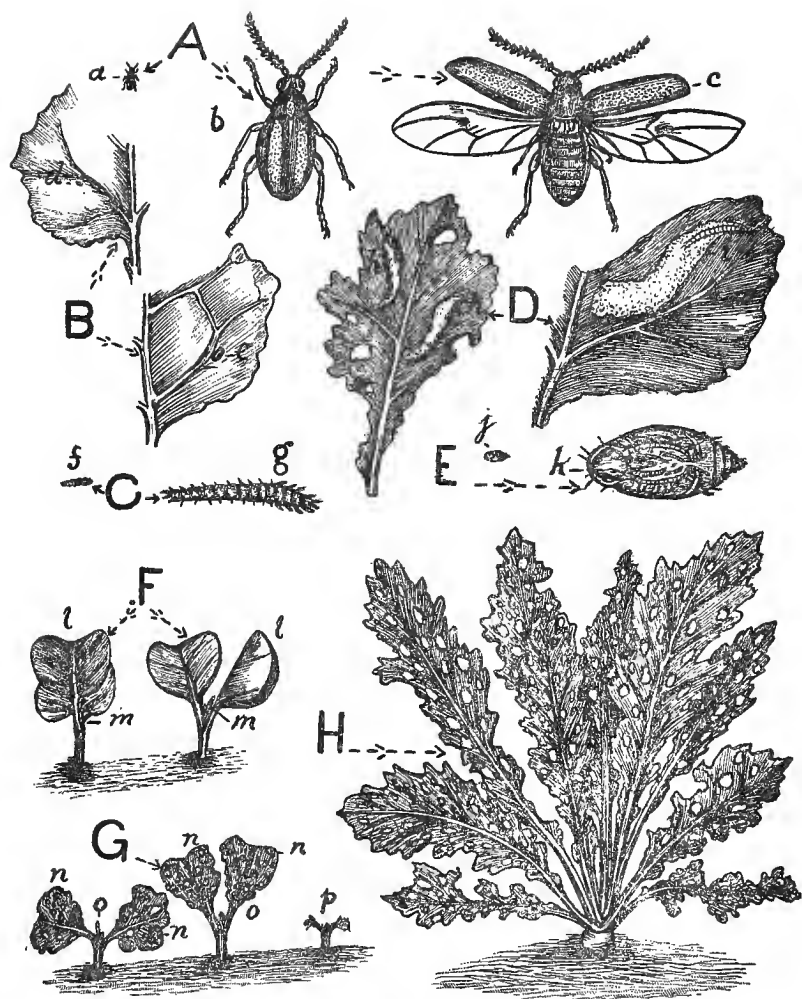
4. By dusting the plants with tobacco powder whilst damp with dew, the pests are either killed or driven away.

5. Rolling cloddy land with a light roller frequently proves serviceable by disturbing the beetles, killing some, pressing the soil about the plants and keeping in the moisture.

6. Catch and kill them by a light wide framework on wheels with well gas-tarred boards fastened upon it, so as to come just over the Turnips. This is an excellent plan, as the beetles when disturbed jump and are caught in the tar. The tar requires to be renewed as it gets dry, and the beetles which accumulate in masses must be scraped off. If the machine be light, as it should, a man pushing it will get over several acres in a day.

THE ILLUSTRATIONS REPRESENT TURNIP "FLY" OR "FLEA" AND
ATTACK ON TURNIP.

A, the Turnip Fly : *a*, natural size ; *b*, magnified ; *c*, in flight, magnified. B, portions of Turnip leaf with : *d*, egg of fly, natural size ; *e*, the same enlarged or as seen with an ordinary pocket lens. C, larva or grub : *f*, natural size ; *g*, magnified.



TURNIP FLEA.

D, portion of Turnip leaves showing mines formed by grub : *h*, natural size ; *i*, magnified. E, pupa : *j*, natural size ; *k*, much enlarged. F, Turnip seedlings not attacked by fly ; *l*, first or seed leaves (cotyledons) ; *m*, second or rough leaf. G, seedling Turnips infested with Turnip fly : *n*, seed leaves eaten and perforated by fly ; *o*, central or rough leaves eaten off ; *p*, seedling practically destroyed by fly. H, plant in rough leaves riddled by biting of insects and mining by larvæ.

WIRE-WORMS.

Wire-worms are the larvæ or grubs of beetles known as *Agriotes*, *Athous* and *Elater*, belonging to the large family of *Elateridæ*. But those which do the most harm to cultivated crops are species of the genus *Agriotes* (*Elater*), namely, *A. lineatus*, *A. obscurus*, and *A. sputator*.

Agriotes lineatus (A, p. 286) is three-eighths of an inch long, and its wing-expanse is over half an inch. Its thorax is tawny ; the wing-cases brown, with lines of yellowish-brown. The antennæ are reddish-yellow, and the legs brown.

Agriotes obscurus (B), rather larger than *A. lineatus*, is tawny-brown in colour, with dark thorax and reddish legs.

Agriotes sputator is not so large as *A. lineatus*. It varies in colour from brownish-black to chestnut, and has grey down upon it, with yellow antennæ and brownish-yellow legs.

These beetles are called "Skip-Jack" or "Click," because when one is held by the end it bends its body

and produces a clicking sound, and when placed on its back it jumps up and makes a peculiar click. The beetles are found under stones at the roots of grasses, in hedges, fields and gardens. They fly well, and lay eggs on grasses, cereals, weeds, and in the earth. The larvæ from the eggs live in the earth near the roots of plants on which they feed. The larva or wire-worm, so called from its likeness in toughness and shape to a piece of wire, is from six- to seven-eighths of an inch long, very shiny, and of a yellow colour. It has a few hairs on its body, three pairs of four-jointed legs in the first three segments, and a sucker foot on the terminal segment. It has very strong jaws meeting over the mouth, well adapted for biting roots and fibres. With these mandibles it quickly tears away the soft parts of the root-stems of cereals just above the roots and kills the plants; it also bites off the roots of various useful crops, and its attacks in garden and field are more to be dreaded than most other insects. It feeds on stems and roots at all seasons of the year, except during very hard frosts, and lives from three to five years in the larval or wire-worm stage, according to circumstances, then, full-fed, it goes down deep into the earth and makes a little oval cocoon of earth, and changes from the larval (A, *c*, p. 286) to the pupal stage (A, *e*) from which the beetle emerges in two or three weeks.

The larva or wire-worm of *Agriotes obscurus* is much like that of *A. lineatus* in shape and colour, but slightly larger in size, and the larva of *A. sputator* is

smaller than that of *A. lineatus*, but similar in shape and general appearance.

It is scarcely necessary to mention the crops that are attacked by wire-worm, and it will suffice to state that hardly any crop is free from their ravages. Cereals, roots and vegetables of all kinds, suffer in turn. Broken-up pasture and "seeds" or Clover-leys often swarm with wire-worms, and on this ground the most serious damage is done to cereals, roots and vegetable crops, also to flower and fruit crops.

Prevention and Remedies.—The great point is so to treat pasture and ley as to destroy eggs or wire-worms that may be in the soil before the land is broken up. The following procedure is advised :—

(a) Feed sheep and cattle with cake or other feeding stuffs so that every inch of land shall be trodden and eaten bare ; then apply a dressing of gas lime fresh from gasworks, two and a half to five tons per acre, thirty-five to seventy pounds per rod, spreading evenly and leaving on the surface a month or six weeks before ploughing, digging, or bastard trenching. This procedure should be done in late summer or autumn, always a considerable time in advance of cropping.

(b) The practice (a) cannot always be followed on small plots, therefore apply ten tons of lime, freshly burned, per acre or one hundred and forty pounds per rod, placing in small convenient heaps and cover with earth. Allow them to remain until the lumps are reduced to a fine powder, then spread in the hot state over the surface. The effect of hot lime is to burn off

the grass and thus destroy the food of the wire-worm. After a few days, plough or dig, or bastard trench the limed land, and on the turned-up soil apply a dressing of agricultural salt, ten cwt. per acre, seven pounds per rod. This dressing not only has a bad effect on wire-worm, but kills Couch or Twitch. The liming and salting should be done in late summer or autumn, some weeks before sowing or planting.

(c) Dress pasture or ley with Mustard dross, one and a quarter cwt. per acre, fourteen ounces per rod, half an ounce (rather less) per square yard, distributing evenly by means of a bellows apparatus, or on small plots by a dredger, shortly in advance of breaking up. Wire-worms are most readily affected by Mustard dross—the refuse from Mustard mills—but too heavy dressings are injurious.

On land infested with wire-worm the preventives or remedies mentioned may be adopted for ridding the land of the pests, particularly the Mustard dross dressing, sprinkling on the surface and pointing in, this being an excellent practice in the case of small plots, operating shortly before cropping. Other useful dressings are :—

(d) Kainit, five cwt. per acre, three and a half pounds per rod, applied in autumn or late winter, preferably in the case of land containing much decaying matter in conjunction with basic cinder phosphate, ten cwt. per acre, seven pounds per rod, digging in, and at the time of sowing or planting applying two and a half cwt. per acre, one and three quarter pounds per

rod, of finely crushed nitrate of soda, but keeping the preparation from direct contact with seed or plant.

(e) A mixture of equal parts air-slaked lime and soot by measure, applying half a pound of the mixture per square yard, and digging in with a fork so as to mix it as evenly as possible with the soil.

(f) Sow Mustard on the infested land and when the plant is coming into flower plough or dig in the crop. This is excellent as a green crop manuring. In the case of infested crops the best remedy is dressing with Mustard dross, one and a quarter cwt. per acre, fourteen ounces per rod, applying when the tops of the plants are dry and keeping as much from them as possible consistent with an even distribution over the whole ground. A light hoeing or pointing in where practicable will be an advantage. Care must be taken not to give a too heavy dressing or the plants will be more or less injured.

A broadcast application of five to ten cwt. per acre, three and a half to seven pounds per rod, of rape dust is an old and well-known temporary remedy for wire-worm, as the grubs of the Click beetles are attracted by it and eat it greedily in preference to the crop. The rape dust, especially that of Indian or Kurrachee cake, which is formed from Mustard seed, both fertilises the land and attracts the wire-worm from the plants. Rape "nuts," the rape-cake crushed into about half-inch lumps, applied at the rate of five cwt. per acre, three and a half pounds per rod, and mixed with soil have been found useful,

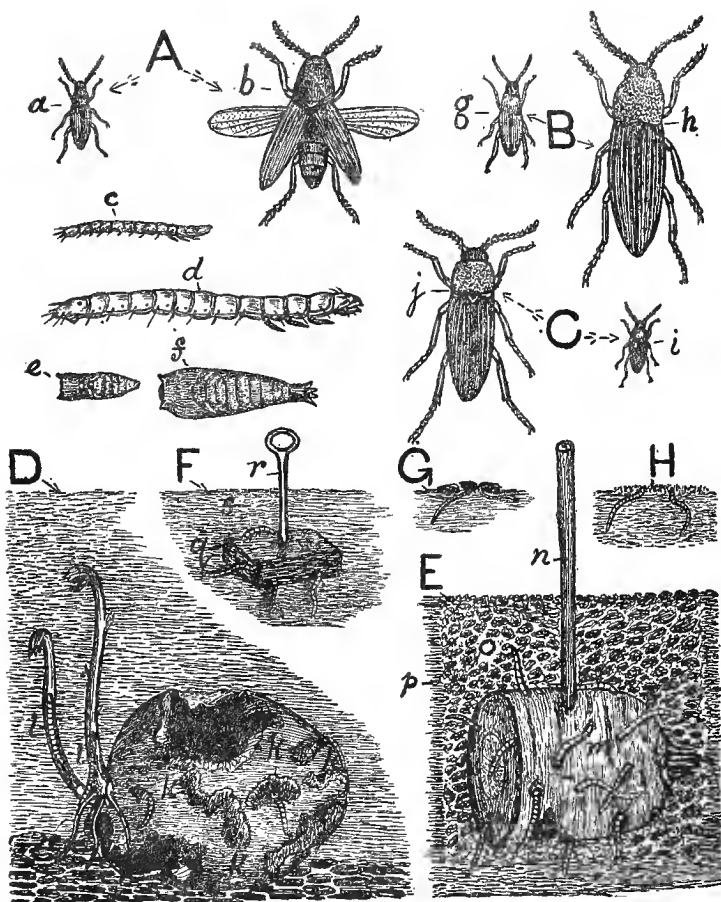
the wire-worms dying where Kurrachee cake was used but not with true rape cake. As the wire-worms are more active in the spring months after a long frost than in a mild winter, then is the best time to use rape meal or nuts, preferably in advance or at the time of sowing or planting crops. If applied in preparing the land for cropping, say a week or ten days in advance, the wire-worm will be attracted to the rape meal or nuts. Dress the land before sowing seeds or setting plants with nitrate of soda, crushed fine, two and a half cwt. per acre, one and three-quarter pound per rod, distributing evenly when the ground is moist, but with a prospect of fine weather or only slight showers for a few days.

Kainit, also crushed fine, may be used in a similar way to the nitrate of soda at the rate of three and a quarter cwt. per acre, two and a quarter pounds per rod. When these substances are used separately there is a danger in getting too much growth from the nitrate of soda, and too little by the use of the kainit. In cases of land broken up from old pasture, or badly infested with grubs and wire-worms, the separate quantities are not only insufficient, but not the correct thing for the crop, say Potatoes or Tomatoes. In that case one and three-quarter cwt. nitrate of soda and three and a quarter cwt. kainit mixed per acre, or three and a half pounds per rod, will be deadly to the pests and beneficial to the crop. Half the quantity suffices on ordinary land, and the mixture is just as good for Tomatoes as for Potatoes.

Traps of Carrot, Mangold-Wurzel, Potato and Swede Turnip have been found of great service in getting rid of wire-worms. Place pieces of these roots, or of rape cake, close to the infested plants. These Carrot, Mangold-Wurzel, Potato or rape-cake traps should be placed close to the centre of the plant or between the rows, about four or five inches deep, this including the bait. Examine every morning for a time, and then once or twice a week, taking out and destroying the wire-worms on each occasion. The traps should be continued during the spring and summer and until winter on badly infested land, and remember that the traps will be likely to be more attractive when vegetation is bursting forth into renewed life in spring. As without guides it is difficult to find the traps, white sticks or wooden skewers with points and thick heads should be used in the case of Carrot, Mangold-Wurzel, Potato and Swede Turnip traps. The sticks show where they are, and enable them to be pulled easily from the soil. In the case of rape-cake traps galvanised iron skewers should be used, and these baits, all points considered, are the best for wire-worms.

CLICK OR SKIP-JACK BEETLES, WIRE-WORM, INFESTED POTATO SET
AND BAITS.

A, common Click or Skip-Jack Beetle, *Agriotes* (Elater) *lineatus* : *a*, natural size ; *b*, the same magnified ; *c*, larva commonly called wire-worm, natural size ; *d*, grub of Click Beetle magnified ; *e*, pupa of *Agriotes lineatus*, natural size ; *f*, pupa enlarged. B, largest Click Beetle, *Agriotes obscurus* : *g*,



CLICK BEETLES AND WIRE-WORMS.

natural size ; *h*, the same magnified. C, lesser Click Beetle, *Agriotes sputator* : *i*, natural size, ; *j*, the same magnified. D, attack of wire-worm on Potato set : *k*, parts eaten of tuber ; *l*, grubs in sprouts or growing stems. E, Carrot trap : *m*, portion of Carrot, length about two inches ; *n*, pointed stick, thrust into bait and long enough to reach above ground, both indicating position and serving as handle to lift bait for examination ; *o*, hole in which bait is inserted and surrounded and covered with soil loosely about an inch ; *p*, solid or ordinary soil. F, Rape cake bait : *q*, piece of rape cake, about two inches square ; *r*, iron skewer thrust into bait after drilling hole with gimlet or auger ; *s*, soil covering bait about one inch. G, rape cake "nuts" scattered on surface of soil to attract wire-worm from growing crop. H, rape dust sprinkled on soil to entice wire-worm.

CHAPTER VIII.

COOKING VEGETABLES.

ALTHOUGH since “dressed” vegetables have been allowed a course to themselves on the well-ordered dinner menu, this branch of cookery has grown in importance, the average English cook is still more or less ignorant of the proper methods of preparing and serving vegetables to the best advantage. I do not propose to give any recipes for elaborate *entremêts*, but merely to take each of our principal English vegetables in turn and to show how they should be cooked in a plain and palatable form.

ARTICHOKES.

Jerusalem Artichokes.—This is by no means made the most of by the average cook, and it is the rule, rather than the exception, to have it served merely covered with a plain “melted butter” sauce, whereas there are at least a dozen ways in which it may be sent to the table. Before giving a few particulars on the subject I must give directions for preparing the vegetable in the orthodox way. Wash and peel the Artichokes, then shape them neatly and throw each as it is

done into cold salted water to which a squeeze of lemon juice, or a small quantity of vinegar, has been added to keep them white. Young Artichokes should be placed for cooking in boiling water, slightly salted, but when they begin to get old or there is any suspicion that they have been touched by frost, they should be put into warm water. Drain them as soon as they are tender, which, if they are fresh and free from frost, will take about half an hour. A suitable substitute for the more ordinary white sauce is a rich sauce made with equal quantities of chicken broth (flavoured of course with vegetables) and milk and finished with the yolks of one or two eggs beaten up with a tablespoonful of cream. The same sauce flavoured with grated Parmesan cheese is also to be recommended, but nothing is nicer than really well-made Hollandaise sauce. Roasted Artichokes are suitable for serving with roast beef or mutton ; parboil the Artichokes in salted water, then bake them in a tin containing some hot beef dripping, and cook them in a moderately quick oven, basting them frequently. Partly cooked Artichokes if cut into rather thin slices can also be fried in butter. If they are required as a garnish for a dish of fillets of beef or mutton cutlets serve them in the form of fritters. Boil the Artichokes until they are just tender, without being soft, cut them into slices and dip them into a light batter and fry them in a bath of boiling fat. Artichoke *soufflé* is useful to serve as a vegetable *entremets* at a time when other vegetables are scarce. The Artichokes after being boiled and thoroughly

drained should be passed through a sieve, then moistened with a rich white sauce (allow half a pint to two pounds of sieved Artichokes), seasoned with celery salt, pepper and nutmeg, and mixed first with the yolks of three raw eggs (to two pounds of the vegetable) and then with the whites whisked to a very stiff froth. Some warm butter should be poured over the top of the *soufflé*, and it should be lightly sprinkled with fine dry bread crumbs before being baked in a quick oven for from fifteen to twenty minutes. Perhaps the delicate flavour of the Artichoke is never more appreciated than when it is served *au gratin*. A *purée* should be prepared as for a *soufflé*, only the eggs should be omitted and it should be delicately flavoured with grated Parmesan cheese; it is then placed in a liberally buttered *gratin* dish and sprinkled with Parmesan mixed with an equal quantity of mild Cheddar and baked until the cheese is a golden brown.

Globe Artichokes.—These are considered by epicures the most delicate of all vegetables; they should be cooked as soon as possible after they are cut, and when they have been trimmed and thoroughly cleansed, boiled in slightly salted water until the leaves can be easily detached. Drain the Artichokes on a hot soft cloth and serve them with melted fresh butter seasoned with salt, pepper and a few drops of lemon juice or tarragon vinegar. The butter should be heated, but it should not be allowed to boil, and the sauceboat in which it is served should be very hot. There are

numerous ways in which Globe Artichokes may be served ; for instance, instead of being boiled entire divide them into four quarters, remove the choke, and cut the leaves, leaving only about a quarter of an inch. Place each piece as it is trimmed into cold acidulated water to prevent any discolouration, and then cook the Artichokes in salted water to which a small quantity of lemon juice has been added ; when they are tender drain them and serve with a rich white mushroom sauce, *Bearnaise béchamel*, *maître d'hôtel*, or thick brown sauce. The vegetable may also be scalloped ; place it in a small buttered pie or *gratin* dish and mask it with some good white sauce, then cover the top with finely sifted bread crumbs (seasoned with salt and pepper) and small pieces of butter, and bake in a quick oven until brown ; if preferred the crumbs may be mixed with an equal quantity of mild grated cheese. If only the bottom portion of the Artichoke is required (and it is useful for many *entrées* and savouries) remove all the leaves and the choke and trim the little green cups, then boil them in salted water until they are quite tender.

Chinese Artichokes.—The peculiarly delicate nutty flavour of this comparatively new vegetable is perhaps best preserved when it is boiled until tender (in salted boiling water) and served with a delicate white sauce, such as that recommended for Jerusalem Artichokes. It can also be fried, after being boiled until just tender, and it may be used in a salad with other vegetables, while it makes a novel and delicious curry.

ASPARAGUS.

As a rule the appearance and flavour of this delicate vegetable suffer during the process of cooking by being placed under water in the old-fashioned Asparagus kettle or a stewpan ; by this method the green tips are cooked before the hard white stalks have a chance of being tender, and they must necessarily be more or less crushed by their own weight. A specially constructed saucepan is required to cook Asparagus satisfactorily ; this keeps the heads out of the water and they are gradually cooked by steam which allows time for the remaining portion to become soft. Asparagus, when cooked, should be carefully drained on a hot cloth, and it may be served with melted fresh butter (as recommended for Globe Artichokes), *Hollandaise Bearnaise*, or cream sauce ; the latter is merely boiled cream slightly thickened with a small quantity of white *roux* (butter and flour cooked together without becoming brown), seasoned with salt, pepper and a dust of castor sugar and flavoured with tarragon vinegar. If it is to be served cold (or iced) mayonnaise sauce or slightly whipped cream flavoured with tarragon vinegar is equally suitable.

BEANS.

French Beans.—These, like all other green vegetables, should be cooked uncovered in plenty of boiling water seasoned with salt and a little castor sugar ;

a pinch of carbonate of soda may be added to preserve the colour. When the Beans are cooked and drained they can be served with melted butter sauce enriched by the addition of the yolk of an egg beaten up with a tablespoonful of cream (or milk), and flavoured with a few drops of lemon juice and a judicious seasoning of salt, pepper and castor sugar. Or the same sauce may be used with the addition of a dessertspoonful (to half a pint of sauce) of finely chopped parsley. A creamy onion sauce is also served with French Beans and also a rich white sauce flavoured with Parmesan. Provided the Beans are young there is no more suitable dressing for them than *maitre d'hôtel* butter, which seems to bring out their flavour. The latter is best preserved by stewing the Beans (when they are quite young) very gently in white stock flavoured with vegetables, a little butter should be added to the stock, and when they are cooked they should be taken from the stock, which should be thickened, preferably with the yolks of one or two eggs and a little cream, and then strained over them.

Broad Beans.—The majority of cooks make the error of serving these Beans in their skins; unless they are very young and small the skins should always be removed, for they are indigestible and they help to spoil the flavour of the Beans. If boiled in an abundance of salted water (which should be quite boiling when they are put in) until the skins begin to crack the latter can be easily removed, the Beans may then be masked with warm butter seasoned with

salt, pepper and a very little sugar, or they may be served with almost any kind of white sauce. When no longer young, Broad Beans, after being boiled, may be passed through a wire sieve, then seasoned with salt, pepper and grated nutmeg and heated in butter with a few spoonfuls of cream or thick white sauce.

BEETROOT.

Although the Beet usually appears in some form of salad it is not to be despised as a hot vegetable, and it should be sent to the table with roast beef or mutton. It is a mistake to boil a Beetroot, the flavour is far better if it is baked in a moderately hot oven, and the juice is not so liable to escape during the process of cooking. In any case care should be taken not to break the skin or both the colour and flavour will suffer considerably. If the Beetroot is to be served hot cut it into moderately thin slices, after the skin has been removed, and reheat it in a thick white sauce coloured with a few drops of carmine the flavour of which has been sharpened by the addition of a small quantity of tarragon vinegar or lemon-juice. Horse-radish sauce is especially suitable for serving with Beetroot either cold as a salad (when a thick mayonnaise should be used as the foundation of the sauce) or hot made thus: Put a small teacupful of grated horse-radish into half a pint of milk and let it simmer until it is tender. Beat up the yolks of two eggs with two teaspoonfuls of tarragon vinegar, add them

to the milk and stir over a low fire until it thickens, then remove the pan at once from the stove ; season the sauce with salt, pepper, a pinch of castor sugar and a little grated nutmeg and add half an ounce of fresh butter divided into small pieces. Heat the slices of Beetroot with a little butter, then arrange them on a hot dish and pour the sauce over them.

BRUSSELS SPROUTS.

If practicable, Sprouts should be steamed and not boiled ; by the former process of cooking much less water is necessarily absorbed than by the latter, and many valuable properties of the vegetable are retained which would be lost by boiling ; moreover, another advantage is that the Sprouts can be more easily and thoroughly drained. The Sprouts should be looked at occasionally so that they may be taken up at the right moment, which is as soon as they are tender without being overdone. When they are free from moisture pour a liberal supply of melted fresh butter over them, which has been seasoned with salt, pepper, and a very little powdered mace and heated in a small saucepan, or parsley sauce can be used instead of butter. Small Sprouts which are quite young may with advantage be added to a salad composed of various kinds of cooked vegetables. They also make an excellent *purée* if passed through a sieve and reheated with a small quantity of white sauce and butter, and may be used as a support for fried cutlets.

CABBAGE.

The above remarks with regard to the advantages of steaming apply to this vegetable also ; but in the event of a Cabbage being boiled the following directions should be carried out. When the Cabbage has been trimmed and washed it should be soaked for about twenty minutes in salted water to which a small proportion of vinegar has been added to free it from any insects which may still be hidden among the leaves. Then blanch it by immersing it in a saucepan of boiling water for five minutes and plunging it into a basin of cold water ; as soon as it has cooled drain the Cabbage and place it in a saucepan containing plenty of fresh boiling water to which salt and sugar (allow a tablespoonful of the former and a teaspoonful of the latter to a gallon of water) and a small pinch of carbonate of soda have been added and let it cook uncovered for about twenty-five minutes. Test it to ascertain if it is done and, after draining it in a colander, press it well to get rid of all the water and serve it in either of the following ways : Place it on a very hot dish and cut it into quarters ; have ready in a small saucepan some warm butter seasoned with pepper, salt and nutmeg, pour this over each piece of Cabbage and serve it with as little delay as possible. Or turn the Cabbage from the colander on to a board and chop it until it is quite fine, then reheat it either in plain butter, seasoning it to taste, or in a small quantity of parsley sauce or broth which has been slightly

thickened. The last suggestion is to make it into cakes, thus : Chop the Cabbage and mix it with about half the quantity of creamy mashed potato ; season it with salt, pepper and a little nutmeg, and form the mixture into little flat cakes on a floured board ; brush them over with butter and bake them in a buttered tin in a quick oven until they are evenly browned.

CARROTS.

Although so largely used for the purpose of flavouring stock of all kinds, in conjunction with other vegetables, and also as a mixed garnish, Carrots are seldom served in England except plainly boiled, with perhaps a little parsley sauce poured over them ; yet there are possibilities in the Carrot of which the inexperienced cook knows nothing. Large Carrots may be satisfactorily stewed by the following method. Cleanse them with a vegetable brush, then blanch them in boiling water and scrape off the outer skin and cut them into moderately thick slices. Butter a stewpan (using about an ounce of butter for the purpose) and put in the Carrots, sprinkle a little powdered sugar, salt, pepper and a very little powdered mace over them, then cover them with boiling stock and let them cook very gently until they are tender, when they should be taken from the pan and kept hot. Measure half a pint of the stock in which they were cooked, add an equal quantity of boiling milk to it and thicken it with a tablespoonful of fine flour which has been smoothly mixed with

a small quantity of cream or milk ; stir the sauce until it is perfectly smooth, then add a tablespoonful of chopped parsley and after removing the pan from the stove add, by degrees, a tablespoonful of *finer herbes* vinegar and pour the sauce over the Carrots. Carrots which are not young can be utilised for a *purée*. After cleaning them thoroughly, scrape or grate off the red outer portion, which is always the best part of the Carrot, and cook it in boiling stock, using some of the fat of the latter or butter ; when done the stock should be absorbed. Pass the *purée* through a sieve, reheat it and season it, then add a small quantity of boiling cream which has been thickened in a separate saucepan with flour and butter which have been cooked together for a few minutes ; mould the *purée* neatly on a hot dish and scatter a little finely chopped parsley over it. There are many ways of cooking small early Carrots, and the following are only a few examples. Trim them, after they are cleansed, so that they are a uniform size in cone or pear shape or leave them round. Then place them in boiling water, seasoned with salt and sugar and enriched with a small quantity of good dripping, or the fat from the surface of some beef stock, until they are tender ; drain them and put them into a saucepan containing plenty of butter and some chopped parsley ; add salt, pepper, a little grated nutmeg and a few drops of tarragon vinegar and serve them very hot. Young Carrots may also be stewed according to the directions given above, but if possible veal stock should be used. When they are done take

them from the stock and keep them hot while the sauce is made. Boil about three-quarters of a pint of the stock, and stir into it the yolks of two eggs which have been beaten up with a gill of thick cream ; the instant the sauce thickens remove it from the stove, add a tablespoonful of chopped parsley and pour it over the Carrots, and serve them garnished with little *croustons*. Glazed Carrots are an effective garnish for braised fillets of beef, noisettes of mutton, etc. Trim the Carrots, and blanch them for ten minutes in boiling salted water ; drain them and put them into a saucepan with a liberal quantity of butter, and stir over the fire until they begin to brown. Then take them out of the butter and put them into another saucepan containing sufficient boiling stock to half cover the Carrots ; season them with salt, pepper and sugar and stir them occasionally so that they may be evenly cooked ; when they are done add a small piece of meat glaze to the reduced stock ; shake the pan, so that the Carrots are evenly coated by the glaze and use them at once.

CAULIFLOWER.

Scrupulous care is required to rid this vegetable of caterpillars during the summer months. The outer leaves should be taken off, the stalk shortened and cut across, and after washing it well and letting cold water from a tap run freely through it, the Cauliflower should be left in salted water to which plenty of vinegar has been added for half an hour. Then

tie it in a thick piece of muslin and plunge it into boiling water which has been seasoned with salt and a small proportion of sugar, and cook it uncovered for about twenty minutes if quite young, or rather longer if it is not tender at the end of that time. Take it out of the muslin and drain it on a hot cloth and serve it with ordinary "melted butter" sauce flavoured with a little tarragon vinegar or lemon-juice, or if preferred tomato or Hollandaise sauce may be used. The remains of a cooked Cauliflower can be baked thus: Divide it into branches, dip them into warm butter and place them on a well-buttered fireproof china dish; season some grated Parmesan cheese with celery, salt and black pepper and scatter it thickly over the Cauliflower, then bake it in a quick oven until it is lightly browned. Another way of utilising a Cauliflower which has been boiled or steamed is in the form of fritters; it must be divided as in the above recipe and then dipped into a thick batter and fried in an abundance of boiling fat.

CELERY.

It is surprising, considering how delicate and wholesome this vegetable is when cooked, that in many households it is never served except in its raw state. Stewed Celery may be served with white or brown sauce and should be prepared as follows: After removing the outer portion and scrubbing the Celery with a brush divide it, and, after washing it thoroughly,

cut it into pieces of a convenient length (about five inches) and tie it into bundles. Have ready a saucepan of boiling water, put in the Celery and let it boil for ten minutes, then drain it, and, if it is to be served with white sauce, stew it gently in milk, or, on the other hand, in stock until it is tender. Keep it hot while the sauce is made by thickening the milk with flour and butter ; add salt, pepper and a little nutmeg and strain the sauce over the Celery. Make a thick brown sauce, using some delicately flavoured soup stock, and after draining the Celery from the stock in which it was cooked arrange it on a hot dish and pour the sauce over it. Scalloped Celery is to be recommended ; in this case the Celery must be cooked, cut into fairly small pieces and mixed with a rich white sauce ; it is then placed in a buttered dish, covered with bread crumbs and baked in a quick oven ; if the flavour of cheese is not objected to a little grated Parmesan mixed with the crumbs is an improvement. Fried Celery is suitable for serving with mutton cutlets ; it must be boiled until tender, then cut into pieces of about two inches in length, and dipped into beaten egg and covered with fine dry bread crumbs, and fried in a wire basket.

CUCUMBERS.

Although indigestible when served in the form of a salad, Cucumbers are quite the reverse when cooked. They should be peeled and cut up lengthwise, and, after the seeds are removed, they should be boiled

until tender in salted water. Drain the Cucumbers very thoroughly on a cloth and serve them with any delicate white sauce such as those recommended for Asparagus. A small Cucumber, after being peeled and partially cooked, may be hollowed out with a vegetable scoop, then filled with a savoury mince (white meat should be used), and after closing the end securely with the piece which was removed, braised until tender and served with brown or white sauce poured over it.

ENDIVE.

This vegetable, like Lettuce, is seldom used in England except for salads, whereas it is excellent if, after it is cooked, it is prepared and served in the same way as Spinach. It should be cooked until tender in plenty of boiling salted water which will take about half an hour or rather less.

LEEKs.

The cheapness of the Leek perhaps accounts for the little consideration it receives at the hands of the British cook, except for the purpose of flavouring stock. It is unquestionably a wholesome vegetable, and if cooked (tied in neat bundles) in the same way as Celery and served with a rich creamy sauce it is equally delicate.

PARSNIPS.

The directions given for cooking Carrots may be followed for Parsnips.

PEAS.

Put a saucepan containing a quart of cold water on the stove, add a teaspoonful of castor sugar, a teaspoonful of salt, a quarter of a teaspoonful of carbonate of soda and a small bunch of mint ; as soon as it boils put in a pint of shelled Peas, which have been well washed in cold water to which a small quantity of powdered borax has been added, and let them boil rapidly, without covering the pan, until they are done. Melt an ounce of butter in a saucepan, and, after draining the Peas in a colander, turn them into the pan, scatter a little castor sugar and salt over them and turn them carefully in the pan with a wooden spoon for a few minutes and serve them very hot. Peas may also be cooked without water in the following manner. Place a Gourmet Boila in a saucepan of boiling water and melt an ounce of butter in it, then add a few leaves of mint and a pint of freshly shelled Peas ; turn them over with a wooden spoon so that they are coated with the butter and while doing so sprinkle over them a teaspoonful of powdered sugar which has been mixed with half the quantity of salt and a little white pepper. Then place a piece of thick buttered paper over the Peas, cover the jar and put the lid on the saucepan ; if the Peas are young they should be done in half an hour.

POTATOES.

To ensure Potatoes being thoroughly cleansed they should be scrubbed with a vegetable brush before being

cooked. The flavour and goodness are best preserved by steaming them, and there are several good appliances to be had for this purpose. When cooked by this means the skin is not removed until the Potato is ready. A saucepan containing a small quantity of butter should be placed on the stove, and each Potato should be put into it as it is peeled to keep hot until all are ready. If Potatoes are peeled in a raw state the skin should be removed as thinly as possible for the best portion of the tuber is to be found just under the skin, and apart from the difference in the flavour if this is removed, Potatoes break much more readily during the process of boiling. Unless they are required for soup, Potatoes should not be cut up before being cooked, as they absorb an unnecessary quantity of water and are deprived of the greater portion of their soluble salts. It is important to add salt (allow a large tablespoonful to half a gallon of water) to the water, as it raises the temperature and helps to keep the outside of the Potatoes firm, also plenty of water should be used on account of the quantity of starch they contain. The water should be cold when the Potatoes are put into it (unless they are new, when boiling water should be used), and it should gradually be brought to boiling point and not allowed to go below it until the Potatoes are done. They should be tested with a skewer and, directly it will go through them easily, they should be drained in a colander, then returned to the empty saucepan, covered with a slightly damp cloth and placed on a warm part of the stove where they will keep hot

and get thoroughly dry. Potatoes which are baked in their "jackets" are often spoiled through being over-cooked. The oven should be hot (without being fierce) when they are put in, and they should be turned from time to time, and shortly before they are ready they should be pierced with a skewer which will allow the steam to escape. Moderately large Potatoes take about two hours to cook in an even temperate heat. Baked Potatoes can be more quickly and perfectly cooked in a French earthenware receptacle sold under the name of the "Diable Rousset".

SALSIFY.

Place each piece of Salsify (which should be about three inches in length) as it is scraped into cold water to which a little vinegar or lemon-juice has been added to prevent its turning brown. Add a tablespoonful of lemon-juice to a quart of water, also a teaspoonful of salt and a tablespoonful of butter or beef dripping, and when the water boils put in the Salsify and let it cook gently until it is quite tender. Then drain it and serve it with melted butter or some richer white sauce poured over it. Cooked Salsify may also be dipped into butter and fried.

SEAKALE.

This should be prepared and served in the same way as Celery, and it may also be iced (like Asparagus) and sent to the table with mayonnaise or cream sauce.

SPINACH.

Remove the stalks and imperfect leaves and wash the Spinach thoroughly so that no grit remains, then drain it and give it a final washing in salted water and put it wet in a stewpan (without any water), and let it cook uncovered until it is tender ; it must be turned once or twice with a wooden spoon, and will take from ten to fifteen minutes. When done press it (preferably in a Spinach strainer which is made with a presser) so as to abstract all the moisture, then chop it until it is quite fine and rub it through a wire sieve. Put the Spinach into a saucepan and add sufficient thick white sauce to moisten it, season it with salt, pepper, sugar and nutmeg and stir it over the fire until it is thoroughly hot and almost dry, then add a good-sized piece of butter or a tablespoonful or two of thick cream ; arrange it neatly on a hot dish and garnish it with sippets of fried bread.

TURNIPS.

The same methods as those recommended for cooking Carrots may be applied to Turnips.

VEGETABLE MARROWS.

It is advisable to steam Vegetable Marrows in preference to boiling them ; they should be washed and dried and after being placed in a steamer a little coarse salt should be sprinkled over them. If young the skin

should not be removed until after they are cooked, when they must be cut up neatly and the seeds taken out. They may be served with any delicately flavoured white or brown sauce, and they may also be scalloped according to the directions given for scalloped Celery.

TOMATOES.

The skin of Tomatoes should always be removed as it is very indigestible. This may easily be done if they are first placed in boiling water for a few seconds. It is important when cooking Tomatoes to serve them as soon as they are ready, otherwise the flavour will be spoilt, therefore when baking Tomatoes cook them in a buttered tin, baste them frequently with butter seasoned with salt, pepper and a dust of sugar and watch them so that they are taken from the oven the moment they are ready ; this will prevent their breaking or having a shrivelled appearance. Baked Tomatoes may be served with the butter in which they have been cooked poured over them and a sprinkle of finely chopped parsley, or they may be masked with brown sauce. Fried Tomatoes need great care to prevent them from becoming too soft. Firm Tomatoes of an even size should be selected, and they should be cut into moderately thick slices and quickly fried in boiling butter, or if intended for a garnish, they may be coated with egg and bread crumbs before being fried, in which case they have a much better appearance. Grilled Tomatoes usually served with fillets of beef are by no

means easy to cook satisfactorily as they break so readily, for this reason it is well to make an exception and leave the skins on. The Tomatoes should be dipped into warm butter and grilled on a well-buttered gridiron over a quick clear fire ; they should be small and not over ripe, and, provided the fire is good, they should not take more than from six to ten minutes (according to their size) to cook.

JEANNE JARDINE.

CHAPTER IX.

FRENCH COOKERY OF VEGETABLES.

VEGETABLES, it must be admitted, do not receive the same consideration in England as in France. If we look for the cause of this unreasonable neglect we find it in the ignorance of the cook ; in her inability to understand the value of the material she has in hand ; in her supercilious designation of all vegetables as “greens” with the exception of Peas, Beans and Potatoes ; and of her contempt for any food that is not animal. She has the opinion—so common to the working classes—that there is no salvation beyond beef.

That vegetables should form a large part of our diet is acknowledged by hygienists ; not exclusively as some people assert, but certainly in larger proportions than the majority of us consider necessary. If in France the vegetable holds a high position in the composition of the daily menu, we must attribute it to the fact that the French people, even in the smallest villages, have a natural taste for cooking, and have discovered that a vegetable, however fresh and well-grown, is insipid if simply boiled in water. Those who have travelled in France will know that almost every pro-

vince has a special mode of preparing vegetables ; some with cream, some with wine, others with herbs, others again with oil and garlic. In Paris, however, where the cooking of vegetables is almost a fine art, the latter ingredients are never used, and are only to be met with in special restaurants frequented by natives of Marseilles and Bordeaux.

Most vegetables are prepared in a variety of forms, and it is no uncommon thing in France to find in one menu a vegetable soup, a vegetable served as a course by itself, and a vegetable salad, in addition to those used to garnish. Even in the matter of garnishing the Peas, Beans, Cauliflowers, Artichokes, etc., are not merely boiled and served without seasoning—as they are by the majority of English cooks—but each vegetable is turned in butter, and salted and peppered before being placed around the dish.

I remember being invited to the inauguration of a celebrated restaurant in London not many years ago. The manager, with pride, informed me that I should taste as good a dinner there as in any of the famous establishments in Paris. Certainly the table was beautifully laid. Flowers and electric lights, dainty glass and china, and all the accessories that make an English dinner-table so attractive, indicated excessive refinement. The menu was perfect—on paper. All the delicacies of the season were enumerated. The soup was excellent, the fish good, and when the *entrée* of chicken was presented, tastefully dressed with Mushrooms and Artichokes in fantastic

shapes, I certainly acknowledged I had rarely seen a more artistically arranged bird, and was prepared for something remarkable in the way of cuisine. But here came the disappointment, for the vegetables that looked so tempting had been simply boiled in water without salt and placed around the chicken like Parsley without any preparation ; placed there simply to please the eye. That these vegetables could have been made an appetising part of the *entrée* never seemed to have entered the cook's mind nor the minds of my English friends who were partaking of them. No French cook would have been guilty of such a flagrant mistake. It required but to dress these Mushrooms and Artichokes in the every-day manner common to the most ordinary French maid-of-all-work, to have converted this chicken *entrée* into a dish fit for a king.

French cooking is essentially practical and economical, especially in regard to vegetables, and it is the object of this chapter to point out the various uses of vegetables with their modes of preparation. Where economy is most noticeable is in the

MAKING OF SOUPS.

In England the idea of a vegetable soup is a *purée, i.e.*, the passing of the cooked vegetable through a sieve. In France the water that has served to boil Asparagus, White Haricot Beans, Cauliflower, Cabbage, etc., is the principal element in the every-day soup, and the vegetable itself is served as a course.

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The commonest soup is the one called *soupe-à-l'oignon*, and although to English ears it may not sound very inviting, to English palates it is very enjoyable.

The *soupe-à-l'oignon* can be made with the water in which either Asparagus, White Beans, Cauliflower or Cabbages have been cooked, or simply with plain water ; the advantage of the vegetable broth is to impart a more agreeable flavour. Cut a couple of large Onions into very small pieces and throw them into a saucepan, fry them well, with hot butter. When nearly brown add a teaspoonful of flour, pepper salt and add the vegetable broth or boiling water. (This mixture boils for a few moments until the onions are quite soft.) In the meantime about a quarter of a pound of Gruyère cheese is grated into the soup tureen, an egg broken therein and some little squares of fried bread added. Gradually the boiling broth is poured into the tureen, while the cheese etc., is continually stirred with a wooden spoon. If the water has been well peppered and salted, this soup will be found delicious.

Soups can be made from every description of vegetables, with or without the addition of "stock". As a general rule the vegetables alone give the flavour to the broth. The invariable custom in household cooking is to start the making of the soup by frying three or four Onions cut into small pieces in a good-sized lump of butter, and the extra flavouring and thickening is obtained by breaking one or two eggs in

the soup tureen, and adding butter. To thoroughly explain the system of vegetable soups it is necessary to give a few recipes.

Potato soup—called in France *Potage Parmentier*—is a favourite with all classes, and, if carefully made, can be served at any dinner. A sufficient quantity of Potatoes are put into a saucepan with water and salt, and cut in halves or quarters, according to size. When they are cooked they are passed through a colander, with a pestle, and placed again upon the fire with the water in which they have boiled. A minute before serving a piece of butter the size of an egg is added, likewise two large spoonfuls of cream, some finely chopped chervil, and some fried squares of bread. The latter are cut into little dice, fried in butter, and put into the tureen before the soup is poured into it.

French pea-soup, or *Potage Saint-Germain*, is a *purée* of dried or fresh Peas, with the water in which they have boiled added to them, and seasoned with salt and pepper. Into this soup pour a teaspoonful of tapioca for each person, and a cupful of cream just before serving. In summer, when Peas are plentiful, a certain quantity of them are kept whole (not made into a *purée*) and added at the last moment to give the soup a more tempting appearance.

Tomatoes also make an excellent soup, and the popular way of preparing the *Potage-aux-tomates* is to take four or five of the ripe fruits and place them on a saucepan with butter, salt, pepper, thyme, laurel-leaf, a

bunch of parsley, and an onion cut in small pieces. Add a little flour and pass this mixture through a sieve to reduce it to a *purée*. In another saucepan boil some rice—about a spoonful per person—let it cook for an hour and then add the Tomato *purée*. Before serving put a piece of butter into the liquid after it has been taken off the fire and sprinkle the soup, when in the tureen, with finely chopped parsley.

Another excellent soup, also made with Tomatoes, is the *Potage Saint-Denis*. This requires a pound of white Haricot Beans, half a pound of French Beans (or Scarlet Runners), three large Potatoes, three Tomatoes, butter, pepper and salt. The Haricot Beans are put in a saucepan full of cold water, and when almost cooked the French Beans are added cut into small pieces, also the Potatoes and the Tomatoes. When the last two ingredients are done they are removed from the saucepan, passed through a colander and put into the soup tureen with a good-sized piece of butter and plenty of pepper and salt.

And here let it be once more well understood that pepper and salt are indispensable in the cooking of vegetables, and that salt should always be placed in the water before the vegetables are thrown in.

At a recent dinner given by a well-known epicure a Lettuce green soup of most appetising colour was placed before the guests. It was excellent and, involuntarily, many glanced at the menu to see the name of this aromatic *purée*. The words *Potage Francesca* did not elucidate the mystery, but the host to satisfy

the general curiosity gave the key to the problem. It was nothing but a *purée* of new Potatoes, cooked in the ordinary way, *i.e.*, peeled Potatoes boiled in salt water, mashed and reduced to a *purée* with the water in which they had been boiled ; a bunch of water-cress finely chopped, a piece of butter, the yolks of three eggs, and a cupful of double cream, peppered and salted, of course. It was a great success and can be recommended as a novelty. Let it be remembered, however, that the water-cress must on no account be allowed to boil. It should be added at the last moment with the eggs, butter and cream.

Crème-de-Choufleurs is the French name for a soup made of Cauliflowers. A large head of the vegetable is cut at the base of every flower, and, with two or three Potatoes is boiled in salted water. When the Cauliflower is cooked remove a few of the flowers and put them in the tureen. Reduce the remainder to a *purée*, adding the water in which the vegetables have boiled, and a teaspoonful of semolina or tapioca for each person. In ten minutes, when the tapioca is done, pour the soup over the heads of flower in the tureen and add a lump of butter. This soup, which makes a kind of cream, deserves to become popular in English homes.

Although every vegetable can be made into a soup with the addition of Carrots, Turnips, Leeks, Onions and a Cabbage to flavour the broth, it is impossible to enumerate all the French vegetable soups. It will be easily understood that all these ingredients help to

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flavour a *purée* of Peas, White Beans, Lentils, Celery, etc. Among the peasantry, where soup is the staple food, a piece of bacon or a sausage is cooked in the water with the vegetables and served afterwards as a meat course; half the quantity of vegetables as a *purée*, the remainder left whole and placed around the bacon or sausage.

THE POTATO.

Having disposed of the vegetable in its uses for soup we will now deal with it in its more important form, and start with the Potato, on which, from a culinary point of view, volumes could be written.

There are said to be five hundred different ways of preparing this tuber, which in England is known only as boiled, steamed or mashed. Fried should also be added to the list—in the opinion of the uninitiated in the mysteries of good cooking—but the sodden or burnt specimens supplied by the average English cook are not worthy of the qualification. Yet nothing is simpler than to fry Potatoes. Let us then proceed to explain this matter of frying which seems as little understood as the making of an omelette. To commence operations take a frying pan and place it on the stove to warm. In a second or two drop in the lard or dripping that is to become the liquid that will change the raw material into the fried or *soufflé* article. This fat must boil before it is of any use, and in order to ascertain if the requisite degree of heat is reached it is only necessary to watch for the liquid to

smoke. In the meantime peel and wash the Potatoes, cut them in slices upon a cloth and dry them ; if the fat is sufficiently heated throw them into it and fry a light brown. When they are well coloured remove them from the pan with a skimmer into a strainer, shake them well in order that all the fat drains through the holes ; sprinkle with salt and toss them so that those underneath receive as much salting as the upper layer, and serve in a hot *entrée* dish. The essential points to ensure success in the frying of Potatoes are : boiling fat and a quick fire.

To *soufflé* Potatoes, or cause each slice to swell to the size of an egg. The operation is equally simple. The raw material must be cut lengthways and must fry on a moderately quick fire until nearly cooked. The Potatoes must be removed before they begin to colour, strained and allowed to cool until they are almost cold, then thrown again into boiling fat and turned about with the skimmer, when each slice will swell if too many are not fried at the same time. Salt in the same way as the ordinary fried Potatoes, and as each small quantity is ready, place in the oven to keep hot. It is always advisable to *soufflé* Potatoes for a small number of persons. They are generally served with a steak, around the meat, or in a separate dish when the steak is not plainly grilled.

Potatoes *sautées* is another form of preparing them to be served with roasted or grilled meats. It is impossible to anglicise the word *sauté*. Boil the Potatoes in their skins, then peel them and cut into

slices. For this purpose a small Potato is better than a large one. Place a good-sized piece of butter into a frying pan and when hot pour in the sliced Potatoes, turn them on both sides and add a little chopped parsley and salt.

Potatoes *Duchesse*. Mash about a dozen potatoes that have been cooked in the oven ; add butter, four eggs and salt ; with a spoon take a portion of this *purée*, make into balls, then flatten them to the size of a small biscuit ; and fry them in hot butter until they are a golden brown on both sides. If there is any difficulty in making them keep their shape before putting them in the frying pan they can be sprinkled with flour.

Potatoes *à la sauce blanche*. Boil the Potatoes in their skins ; peel them as quickly as possible, so that they retain their heat ; cut them in slices ; place them in a dish, and cover them with a white sauce, made with flour, butter, boiled milk, salt and pepper. (Although the description of sauces does not form part of this notice, it may be interesting to know that this sauce, called *béchamel*, although well known in England, is not properly prepared if the flour does not boil for ten minutes when the milk is added to it.)

In the country in France, during the shooting season, Potatoes *au vin* is a favourite dish with sportsmen. A large piece of butter is put into a saucepan, then a tablespoonful of flour, salt, pepper and some chopped onions or chives. This mixture is well stirred together and placed on the fire with a tumbler full of white wine and a cup of cream. When it boils, slices of

Potatoes—that have been cooked and peeled in the same manner as in the preceding recipe—are added to the sauce, and the dish is ready for table.

These Potato dishes made with a sauce, it is almost needless to say, are never served with meat, and constitute a course by themselves for family dinners, suppers or luncheons.

Whereas the Potatoes *au vin*, just described, are seen at gentlemen's tables, the Potatoes *au lard* occupy a less exalted position, and are patronised by cyclists and tourists of all descriptions when they find themselves at a country inn not prepared for visitors from town. It is a substantial dish that is worth knowing. A piece of bacon is cut into small squares and fried ; when sufficiently cooked a teaspoonful of flour is added and turned in the pan until it is quite brown ; then follow pepper, parsley, thyme, and a laurel leaf ; a little stock or water ; and boil for five minutes. Then put in the Potatoes raw, that have of course been peeled and washed, whole if they are new, otherwise cut into halves or quarters—according to the size. When the Potatoes are cooked the fat is skimmed off, and the dish can be served.

Potatoes *au fromage*. This is a very simple but excellent recipe. About a dozen Potatoes are boiled in their skins, peeled and passed through a colander. A layer of this *purée* is placed at the bottom of a round deep dish, covered with grated Gruyère cheese, salt and some little pieces of butter. This operation is repeated with successive layers of Potatoes, cheese

and butter, until the dish is full—the surface to be covered with some grated Parmesan mixed with the Gruyère. The dish is then put into the oven for about a quarter of an hour until the contents are of a golden brown colour.

Reluctantly we now leave the Potatoes, about which so much still might be said, and come to the green vegetables.

As has already been stated, when vegetables are served with the meat there is but one way of preparing them. Be they Peas, Beans, Cauliflower, Cabbage, Artichokes (*fonds*), they are first boiled, then taken out of the water, strained, and put into the saucepan and *sautéed* with butter, pepper and salt. Always remember that the butter must first be quite hot, which is indicated by the fact that it leaves off “singing”. The following recipes will, therefore, solely deal with vegetables served as a course, as is customary in France.

SPINACH

Is very much neglected or little understood in England. In France it is excellently prepared. After the leaves are washed and all the hard stems removed, they are thrown into a saucepan full of boiling salted water. When cooked they are pressed in the strainer to free them from water, placed on a board, and chopped fine; then put into a saucepan with a good-sized piece of butter, allowed to boil in this butter for a quarter of an hour on a slow fire, with the addition

of a little salt, a pinch of flour and a small quantity of milk or cream. They then simmer for another quarter of an hour and are served with little squares of fried bread. Instead of milk or cream, some people moisten the Spinach with good stock or strong gravy.

FRENCH BEANS

Must be chosen very young, small and tender, before the seed has formed. If they are too long they are cut, but this is rarely necessary if they are young. They must be washed, of course, but they are never sliced into small pieces as is the custom in England, where Scarlet Runners are so frequently consumed in the place of the real French Bean. The secret of preserving their bright green colour is to throw them into boiling water with a handful of salt at the same moment. When cooked they are taken out of the water and strained in a colander. In another saucepan heat a piece of butter with a pinch of flour, salt, a glass of milk, or some of the water in which the Beans have been boiled ; add the Beans and serve with two yolks of eggs, beaten with a little chopped parsley and chives, added to the sauce.

Another way of preparing French Beans after they have been boiled, is to place them in a saucepan with a little butter, salt and pepper, and to pour over them half a cup of cream at the moment of serving.

French beans *à la maître-d'hôtel* are boiled in the preceding manner, and when nearly done are put

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into another saucepan with butter and chopped parsley, salt and pepper, and a teaspoonful of vinegar.

CAULIFLOWERS

In France are neither served nor cooked whole, which has the advantage of allowing them to be well washed. The Cauliflower is cut at all the branches and the hard skin peeled off each stem, thrown into boiling water, which has been well salted, and when cooked taken out and strained, in order to give them the appearance of the whole vegetable; each flower is placed head downwards in a pudding basin, turned out upon a dish, and then covered with a good white sauce. The hard stalks of this vegetable are never served at table.

Another way. After the Cauliflower has been turned out upon the dish and has the exact shape of the vegetable in its entirety, it is mashed with a tomato sauce.

Cauliflower *au gratin* is boiled, as already indicated, placed in a dish that can stand the oven, and covered with bread crumbs, grated Gruyère, and small pieces of butter. When well browned it is ready for serving.

There is nothing very remarkable to tell about

CARROTS OR TURNIPS.

These vegetables are rarely served by themselves but are indispensable in the making of stews and soups,

and for flavouring purposes. In the French national dish *bœuf à-la-mode* Carrots play an all-important part. They are cut into slices after having been scraped, and are thrown into the saucepan wherein the piece of beef is simmering with onions. Sufficient water to cover them is added with a tablespoonful of brown sugar, salt and plenty of pepper. In fact neither Carrots nor Turnips are ever prepared without the addition of a little sugar. For garnishing cut in the shape of pears and cook in boiling water for about ten minutes. Then butter the bottom of a flat saucepan, put in the Turnips or Carrots, sprinkle with white powdered sugar and moisten with a little stock ; butter also a round of white paper, the size of the saucepan, and cover the vegetables with it, the butter downwards, of course. Put the saucepan in a quick oven at first, and then open the oven door to finish cooking slowly. They can be served by themselves and are much appreciated by some people and should be dressed in a pyramid. In the country Carrots and Turnips, like nearly all the green vegetables, are often *sautéed* with butter and a bowl full of cream added the moment before serving and while the vegetables are still on the fire ; but in towns cream is less often used for the common vegetables, as it is more costly than the vegetable itself.

ASPARAGUS

Is boiled in France in exactly the same manner as in England, always with the addition of salt in the

water, but it is never covered with a sauce. The stalks are placed upon a table-napkin upon the dish, the stalks all one way, and sometimes the dish is garnished with hard eggs. The sauce is served separately and made either of melted butter, or with oil, vinegar, pepper and salt. A favourite sauce is simply a conjunction of butter and cream, ingenious and delicious. A good-sized piece of butter is melted in a small saucepan with a pinch of flour and the cream, according to the quantity required to fill the "boat," whipped into it when it is taken off the fire. Asparagus points make an excellent dressing for a chicken or cutlet *entrée*, and are almost as often bought tinned as fresh, especially as they are covered with a white sauce made by *sautéing* in butter and adding a little cream.

PEAS.

Peas *à la Française* are placed in a saucepan with a piece of butter the size of an egg, and worked with a spoon. Add a lettuce and ten or twelve small onions, stew for an hour with salt and pepper and a bouquet of parsley, that is to be removed when the Peas are cooked. As the quantity of liquid diminishes pour in a little hot water.

Peas are also served cooked in butter with the addition of a little sugar and cream, with water added, if necessary, so as to keep them from burning.

In this list many vegetables have been omitted

because they are not easily obtained in England, such as Aubergines, Endive (called Chicory in England), Salsify, etc., but it is perhaps advisable to mention

GLOBE ARTICHOKE.

These are washed and placed in a large saucepan of boiling water with a handful of salt, the water, however, must not fully cover them. They require boiling for about an hour, and when a leaf can be pulled out easily they are done. When taken out of the water they are left to drain with the points downwards, and are generally eaten with a sauce made of oil and vinegar, pepper and salt.

And now a word about

SALADS.

In England all vegetables called salads are eaten raw. In France Lettuces and Chicory are as often served hot, prepared like Spinach, or made into a regular salad with oil and vinegar. But the most important of all salads are those prepared with the common vegetables, either as a *Macedoine* (i.e., a mixture of Peas, Beans, Flageolets, Potatoes and Carrots) or by themselves. Thus Potatoes and Beans of every description make excellent salads, boiled and allowed to cool, and then dressed with oil and vinegar, pepper and salt. French Beans as a salad are often dressed with cream instead of oil. In the same way a mixed vegetable salad is often considered

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more delicate if the oil is omitted, and cream used in its place. The French recipe for mixing is one part vinegar to two parts oil, and if the vinegar is very strong even a smaller quantity is required.

The great mistake made by many English cooks is to cut a Lettuce into too small pieces. In France a leaf is divided into three or at most four parts, washed, and then well drained in a wire basket, and only dressed at the moment of serving. Cooked vegetables, on the other hand, should be dressed some time in advance to allow the vinegar to penetrate.

A good Potato salad is made with a mayonnaise and a sprinkling of capers, but care should be taken to boil the Potatoes in their skins and only peel them afterwards, so that the flavour is not lost in the water.

A fancy salad, once the rage in Paris, was invented by Dumas fils and is described in his famous comedy "Francillon," produced at the Comédie-Française, and wherein truffles play an important part. But beyond being rather costly it was not interesting. Fancy salads have always been a favourite dish with the French, and besides the mayonnaise of vegetables, called *Salade Russe*, a popular salad is *La Malgache*. This deserves a minute description, as if once known in England it will be surely as popular on one side of the Channel as on the other. Boil four or five Kidney Potatoes in their skins, peel them and cut them in slices, not too thick, and put them in a salad bowl. Boil also a large Celery root after having

peeled it. Let it cool and cut it up in slices about the same size as the Potato. Add to these two white vegetables a Beetroot, also cut in slices, pour over them all a good mayonnaise sauce and mix well together until the salad becomes a pretty pink colour. This can be prepared some time in advance and never fails to prove a success.

Tomato salad is made by selecting the fruit while it is firm. Each Tomato is wiped with a cloth, not mashed, cut into thick pieces, not into slices, and mixed with oil, vinegar, salt, pepper and chopped onions.

It will be seen by these few explanations that the French cooking of vegetables is an art, but one easily acquired by the most inexperienced of English cooks. All that is wanted is a little care and the observance of the golden rules: to add salt to the water when boiling vegetables; to strain them well and turn them in butter; to add cream whenever it can be obtained; never to throw away the water in which Asparagus, Cauliflower or White Beans have been cooked, as this water makes excellent soup with rice or tapioca added, and an egg and butter beaten together in the soup tureen to give it the requisite consistency; never to serve a Cauliflower—or any other vegetable—with a white sauce if the flower has not boiled for at least ten minutes; and never to use inferior butter in the cooking of vegetables, as in the quality of this ingredient lies the difference between mediocrity and excellence.

F. K.

SEED SOWING.

What to Sow.	Time of Sowing.	Varieties to Sow.	Season when ready.
Asparagus.	April, May.	Connover's Colossal	April to
Artichoke, Globe.	March.	Giant Argenteuil.	July.
Bean, Dwarf (not forced).	April.	Green or Purple Globe.	June to October.
	June.	Plentiful, Ne Plus Ultra.	June to August.
Bean, Broad.	February.	Canadian Wonder, and others.	July to September.
	March.	Early Longpod.	June.
	April.	Green Longpod.	July.
	May.	Monarch and Windsor.	August.
Bean, Runner.	November.	Windsor, Green.	August.
	May or June.	Early Longpod.	June.
		Scarlet Emperor, Best of All, Hackwood Success.	July.
Broccoli.	March.	Autumn Protecting.	October.
	April.	Michaelmas White.	November.
	May.	Christmas White.	December.
	April.	Leamington.	Spring.
	May.	Late Queen and Model.	Spring.
Brussels Sprouts.	March.	Cambridge Champion, Dwarf Gem, Holborn Exhibition.	October to March.
Beet.	April, May.	Crimson Ball, Globe.	July.
Borecole.	April.	Cheltenham Green Top.	Winter.
	May.	Green Curled, Scotch.	Autumn.
		Arctic, and others.	Winter.

What to Sow.	Time of Sowing.	Varieties to Sow.	Season when ready.
Cabbage.	February.	Favourite, Little Queen.	Summer.
	May.	Winningstadt.	Winter.
	June.	Coleworts', Rosette and Green.	Winter.
	July.	Ellam's Dwarf, Early April.	April to June.
Carrot.	March.	Early Nantes, Early Gem.	June.
	April.	Model, Early Short Horn.	July.
	May.	Main Crop Varieties.	Winter.
Cardoon.	April and May.	Large Spanish, Early Tours.	June to October.
Cauliflower.	March or earlier.	Snowball, Early Forcing.	May.
	"	First Crop, Walcheren.	June.
	April and May.	Early Giant	August to October.
	March.	Autumn Giant and Mammoth.	Autumn.
	April.	Witloof.	Winter.
Chicory.	February.	Aldenhams Pink Perfection, White Gem.	September.
Celery.	March.	Solid White.	October.
	"	Major Clarke's Red.	December.
	"	Standard Bearer.	Late Winter.
Cucumber.	January to December.	(Frame and indoor varieties.)	
Endive.	June.	Early Green, Curled.	September.
	July.	Batavian Varieties.	Winter.
Leeks.	March.	Lyon, Musselburgh and Holborn Model.	Winter.
Lettuce.	February.	Golden Queen, Hicks' Hardy.	May and June.

SEED SOWING

What to Sow.	Time of Sowing.	Varieties to Sow.	Season when ready.
Lettuce.	Monthly.	All Year Round, and others.	Summer and Autumn.
Onion.	August to September. February to March. August.	Hammersmith, and Brown Cos. Main Crop Varieties. Autumn Varieties.	Spring. Autumn and Winter. Spring and Summer.
Parsley.	March to August.	Garnishing Varieties.	All year.
Rhubarb.	April.	Victoria and Hawkes' Champagne.	Spring.
Parsnips.	March.	Sutton's Early.	Winter.
Radish.	April.	Student.	Winter.
	February.	Tender and True.	Spring.
		White and Red Forcing.	April.
	March.	Early Frame.	May.
	April.	Long White and Scarlet.	June.
	August.	French Breakfast.	September.
Salsify.	September.	China Varieties.	Winter.
Scorzoner.	April.	Mammoth.	Winter.
Peas.	May.	Russian.	Winter.
	February.	Chelsea Gem, Green Gem.	May.
	March.	Daisy, Gradus.	June.
	April.	Duke of Albany, Quite Content.	July.
	May.	The Gladstone.	August.
	June.	Autocrat, Masterpiece, Peerless Marrowfat.	September.
	July.	Michaelmas.	October.
		Latest of All.	November.
Savoy Cabbage.	March.	Green Curled, Early Ulm.	Autumn.

SEED SOWING

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What to Sow.	Time of Sowing.	Varieties to Sow.	Season when ready.
Savoy Cabbage.	April. May. May.	Perfection. Sugarloaf. Drumhead.	Winter. Winter. Late Winter.
Seakale.	April.	Lily White, Purple.	Winter to Spring.
Spinach.	February. March. April, June. May. August.	Carter's Early. Long Standing. Victoria Round. New Zealand. Long Standing.	May. June. Summer. Autumn. Winter.
Tomatoes.	January.	Sunrise. Perfection.	June. July.
	March. May. July.	Duke of York. Polegate. Winter Beauty.	Autumn. Autumn. Winter.
Turnips.	March.	Early Forcing, White Gem.	May.
	„	Early Milan, Snowball.	June.
	April.	Snowball. White Model.	July. August.
	May to July.	Red Globe, Veitch's Jersey Lily.	Autumn.
	August.	Golden Ball.	Winter.
	September.	Chirk Castle.	Spring.
Vegetable Marrow.	March.	Perfection.	Summer.
Herbs.	April, May.	Pen-y-Byd, Custard.	Autumn.
Potatoes.	Spring.	In Variety.	Autumn.
	February.	Sharpe's Victor, Ninety-fold, Ringleader.	May and June.
	March.	Ashleaf Varieties.	June.
	April.	Sir John Llewelyn.	July.
	„	Windsor Castle.	August.
	„	Supreme.	September.
	„	Epicure.	October.
	„	Snowball, Factor.	November.
	„	Goldfinder, Monarch, Syon House Prolific, Triumph, Up-to-Date.	December to June.

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PLANTERS' TABLES

What to Plant.	Date.	Varieties.	Season.
Cabbage.	May.	Sutton's Maincrop,	August.
	"	Favourite, Gem.	September.
Coleworts.	June.	Hardy Green,	Winter.
		Rosette.	
Winter Cabbage.	"	St. John's Day, Win-	December
		ningstadt, Christ-	to March.
		mas Drumhead.	
Cardoon	May.	Spanish, Large	October to
(sown in April).		Solid, Tours.	March.
Cauliflower.	March.	Snowball, Early	May.
		Forcing.	
	"	First Crop, Early	June.
		London.	
	June to	Pearl, Early	
	July.	Giant, Autumn	August.
		Giant.	
	October.	Early London,	September.
		Walcheren.	
	"	Early Dwarf	May to
		Erfurt.	June.
Celery.	May to	Early Rose,	October.
	July.	White Gem, Solid	
		White, Aldenham	
		Pink.	
	"	Major Clarke's	December
		Standard Bearer.	to April.
Cucumbers.	January.	Every Day, Model.	March.
	March.	Telegraph, Match-	June.
		less.	
	July.	Ideal.	August.
	September.	Peerless, Delicacy,	Winter.
		Telegraph.	
Endive.	June to	Green Curled,	September
	August.	Batavian.	to March.
Lettuce.	February.	Hammersmith,	April.
		Hicks' Hardy Cos.	
	April.	Golden Queen.	May.
Lettuce.	May to	In Variety.	June to
	September.		December.

What to Plant.	Date.	Varieties.	Season.
Rhubarb (seedlings).	March.	Victoria, Hawke's Champion.	April to June.
Leeks.	" May.	In Variety. Holborn Model, The Lyon, Mussel- burgh.	" Winter.
Onion (sown under glass).	March and April.	In Variety.	August, September.
Onion, Autumn.	February.	In Variety.	June.
Peas (sown under glass).	March.	Green Gem, May Queen.	May.
	"	Chelsea Gem. Gradus, Daisy, Early Morn, Quite Content.	June.
Savoy.	May to July.	Early Ulm, Green Curled.	October.
	"	Sugarloaf, Per- fection.	December.
Seakale.	" March.	Drumhead. Purple.	February. November to May.
	April.	Lily White, Bed- dord's Improved.	"
Tomatoes (raised under glass).	May to June.	In Variety.	July to October.
Vegetable Mar- rows (raised under glass).	May.	Perfection, Prince Albert.	June.
	June.	Pen-y-Byd, Cus- tard.	July to October.
Potatoes.	February.	Ringleader, Ninetyfold.	May.
	March.	Ashleaf Varieties.	June.
	April.	Windsor Castle, Supreme, Satis- faction.	July to October.
	"	Epicure.	December.
	"	Schoolmaster, Snowball.	February.
	"	Goldfinder, Factor, Up-to-Date.	March to June.
	"	Syon House and late varieties.	"

CHAPTER X.

GATHERING, STORING AND PACKING OF VEGETABLES.

It is of great importance to gather, store and pack vegetables so that when they reach their destination they are fresh and wholesome. Many vegetables are left too long upon the ground before they are used. Some may ask how can large supplies be prevented from turning in at one time thus creating a glut and in the end causing the crop to be left longer than is advisable. This has been explained in the cultural notes. The best remedy is doubtless to sow more frequently and in smaller quantities and to avoid having so much material ready at one time. Vegetables cannot be too fresh, and private growers have a great advantage over those who have to purchase their supplies.

With regard to storing vegetables it frequently happens that certain sorts must be stored to prevent injury by frost or to check gross growth. For instance, the Cauliflower or Broccoli, lifted with roots intact, may be kept good for weeks in a cool place, whereas in the open it may get overgrown or injured by severe weather.

ASPARAGUS.

This is placed first because it is one of the most important of vegetables. Asparagus must be large, of a good length and the points close and not too open, that is, the growths must not be too much developed. With regard to blanching the stalks, there is a great diversity of opinion. Many prefer the green or exposed portion, others the blanched, but generally the upper part is of better quality when of green colouring through exposure. On the Continent, mostly in France, a great trade is done in this vegetable, and the remark is sometimes made that the very fine growths sent to this country are quite distinct from those produced in England, but this is not the case. There is no doubt whatever that culture has much to do with quality both as to size and flavour. Many pay great attention to the formation of the beds but not sufficient to after attention. Others fail to feed, and frequently the plants are grown much too close together.

Large growers often make only two sizes, but we would advise three as it will be found when grown for sale that there will be a demand for the best Asparagus. The medium-sized can be used at home with the large but in no case is it well to mix small and large together as when cooked the small is spoilt and the large insufficiently boiled. The small shoots are termed the "sprue," and this is useful for soups, but there is often too much sprue where poor culture is

given and this makes the plant far less profitable. Bunching depends upon the season. *Asparagus* forced very early is often put up into bundles of twenty-five, whilst later on fifty and one hundred are the usual quantities. When large quantities are grown for sale the shoots are washed if needed and neatly tied. Some place the bundles in water but if left any time the tops soon double over. The best plan is to lay them thinly in cool sheds and lightly damp over, then cover to exclude the light. A very large *Asparagus* grower adopts the following plan. The beds are gone over daily and the growths put into three sizes, placed in layers on the floor and packed three times a week. Over each lot is placed damp moss covering them over so that the growths are quite dark and they do not get much air. Stored in this way they keep quite fresh and do not lose flavour. In private gardens small quantities of *Asparagus* are sometimes cut and placed under say one foot of soil. This answers well if there are insufficient shoots at one cutting, and is preferable to placing in water in shallow pans. When forced *Asparagus* is packed it is well to wrap each bundle round with soft paper, and if sent any distance the bundles must be made firm so that they do not move. It is well to place the heads in the centre. For forced *Asparagus* fresh moss quite free from soil or grit is a good packing material. When this is used the shoots keep good for several days if placed in shallow flats and ample space is given for the lids. Large quantities if placed close together travel well in

shallow baskets or flats with a little soft packing under the bottom layer and the upper portion papered over. Of course in packing vegetables of any kind the sender is obliged to study weight. Any unnecessary addition adds to cost. On the Continent very light baskets are used to great advantage.

It is often asked at the time of cutting whether the beds should be cut over entirely without leaving any small growths or spray. This practice is advisable except in the case of beds grown specially for a late supply but even then there must be hard cutting.

ARTICHOKES.

There are three kinds : the summer and winter kinds (the Globe section) are in season from June to October and the tuberous-rooted varieties from October to May. The Globe Artichoke is a greater favourite on the Continent than in this country. The heads are at their best when full grown, that is just before the centres begin to open out ; when cut in a smaller state they lack substance and are drier. The heads will be full and fleshy at the base when fit for use ; they keep for some time when the stalk ends are put into water in a cool dark place. The heads at cutting should have about three inches of stalk attached, but this of course is removed just before cooking. The heads are very tender when full grown, so that in the early autumn months it is well to cut them as soon as matured and keep as advised. The

Jerusalem is different in every way, the growth being much like that of a sunflower, and the edible portion is the root. This vegetable is best left in the soil and lifted as required for use, but in some seasons this is not practicable as if the season is severe lifting is stopped. To get over this difficulty lift and clamp like Potatoes, sorting out the seed and covering over with dry litter. To keep the tubers from sprouting place the clamp on a north border or under trees. When stored in a warm shed the roots quickly grow out and become black and flavourless inside when cooked. The Chinese Artichoke or *Stachys tuberosa* is a small spiral-shaped tuber in season during autumn and winter. These are best lifted from their growing quarters as required for use. To preserve them from frost cover the soil over with litter. These being small are best packed in small boxes or bags. If stored choose a place just frost-proof and use plenty of soil or sand between the roots.

BEANS

Are of three kinds ; the Dwarf or French Bean is in season all the year if forced, but it gives a poor return in mid-winter. If grown in strong heat the pod soon gets old and tough. It is therefore desirable to gather daily as the pods keep well if tied so that the stalk ends are level and then placed in shallow pans in a cool place, twenty-five to fifty pods in a bundle being a good quantity according to the size of the pods

and the season. The bean hardens if placed in water, and to keep the water pure it is well to add a few lumps of charcoal. Forced plants very early in the season produce a large number of small pods. These are unsaleable. It is well therefore to sort them and not grow the plants too thickly so that the pods can properly develop. In packing use some soft material on the top of the basket as the pods bruise quickly if not protected. The open ground supply is from June to October, but the crop must be gathered regularly otherwise the pods fail to set. The pods from the open are usually gathered into cross-handled baskets and sold by the pound when sent to market. The Runner Bean needs much the same treatment as regards gathering, as if the pods form seed they are of little value as a vegetable. For market large quantities are grown, but of late years the Climbing Runner or French Bean has become a great favourite. Though the pods of this variety age more quickly the plants crop freely and the pods being more shapely are much liked. This section is usually packed in half sieves or bushels for market, the tops being covered over with long grass and protected by willows. The earlier the plants can be got to produce the more valuable the supply ; indeed, it often happens that the earliest pods sent to market in pounds in small flats give a much better return than bushels later on. In the private garden the same results should be encouraged, as the earlier the produce the more it is valued.

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BROAD BEANS

Are in season from June until August or later, but in gardens the earlier supply is most relished, as this Bean in hot weather soon hardens and has a rough taste. It will be found advisable to gather the pods when they are only small, say a little more than half grown. Cooked at this stage they are wholesome and delicious. Another way to make the larger Bean more palatable and remove the rough taste so much disliked is to skin the Beans. By removing the outer skin the Bean is sweeter and more tender. Of course for market it would not be profitable to gather the pods in the small state advised and they would also suffer if placed in bulk in a tender state. This shows the advantage of home-grown supplies. If quantities of green vegetables are placed in bulk they heat and are not good for food. To keep the pods after gathering place them in a dark cool shed on the floor thinly and lightly damp the pods over daily. Treated thus they will keep a week without loss of flavour. Broad Beans may be had earlier by forcing, and grown thus they are well worth the labour and cost entailed.

BEETROOT.

The Globe-shaped Beetroot being of more rapid growth does not keep so long as the others, but the roots may be had good during summer. It is not advisable to grow them for winter supplies as they should not be

allowed to get coarse for they soon lack colour. They are at their best when used as large as a cricket ball. The tap-rooted or long Beets will give a supply from September to May when in a cool store just frost-proof, but they need careful lifting as damage to the roots results in bleeding and poor colour. They are best lifted in early November and stored in fine soil, sand or ashes, using plenty of these materials between the roots to prevent shrivelling, as this quickly affects the quality. The tops at lifting time are twisted off, not cut with a knife, and large coarse or divided roots should be put on one side as they are not worth storage. Put them in an open shed and use plenty of packing between. This is preferable to a warm cellar as a little frost is far less harmful than too much warmth. For market the roots are often clamped and sent to market by the tally or in bushel baskets.

BORECOLE OR KALES.

It is important to prevent the plants seeding in spring, and to do this cut them over frequently after cutting for the house begins. The best way is to use the green varieties as soon as possible. Though they keep some days in a cool place, when exposed too long the flavour is impaired. They are easily packed to send long distances and for market are placed in large round baskets or crates. The smaller greens or later cuttings do not find so ready a sale as the tops so

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that it is well to grow both early, mid-season and late varieties for these respective seasons.

BROCCOLI.

One of the most valuable of vegetables, as the plants give a supply from October until June. The autumn Broccoli follows the Cauliflower, the latter being less hardy than the Broccoli. Much may be done in winter to keep small heads of Broccoli after their formation by lifting the plants and placing them in a cool frame or shed, care being taken that the roots and a portion of the soil are retained. Plants lifted at the approach of frost and treated in the way advised may be kept fresh for some time. When they are only to be kept for a few days tie the leaves over the heads and suspend the plants in a cool cellar. The white curd of the flower soon blackens and is destroyed by a little frost, hence the need for storage to prolong the supply when frost approaches. To keep the heads uninjured they also need shading from the sun, though some varieties have leaves that fold naturally. When the leaves are more open break the upper ones over the heads. To retard plants in April and May lift and place them in a shady quarter close together, well covering the heads with the foliage. When Broccoli are to go any distance leave a good portion of the leaves as these protect the head. Large quantities of Broccoli are sent from abroad to this country in winter and they arrive in splendid condi-

tion, being packed in small cane baskets. Early in the year large quantities are sent from Cornwall and other parts of the south coasts mostly in baskets or crates. They travel well as the leaves when cut with the plants protect the heads. With regard to the best time to cut the heads that depends upon the variety. Some varieties are very large, but these are by no means the best in flavour, a small or medium-sized head being preferable. The heads should be cooked as advised in a previous chapter.

BRUSSELS SPROUTS.

This vegetable remains fresh and wholesome long after it is fully developed. The small or medium-sized compact bullet-like Sprout is the most liked. Some varieties produce very large Sprouts that soon expand, but if a small Cabbage is needed they should not be grown as Sprouts. These winter badly. In gathering, the Sprouts should be broken off and the top growth retained till the whole are gathered, as a natural protection is thus provided. Given cool storage the Sprouts retain their freshness for some days, and before they are sent in for the table clear away any useless leafage or yellow growth. Never pack them in very large quantities as they then heat. They are sent to market in half sieves and sieves or bushels and are best when well graded, as very small or open Sprouts should not be gathered. The same remarks apply to this vegetable sent in hampers for

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private use. It is much better to send well-sorted and useable Sprouts than those having useless outer leaves.

CABBAGES.

There is no gain in keeping Cabbage heads till they are very hard, indeed for home supplies the quickly grown tender and small heads are more appreciated. Coleworts are the autumn varieties of Cabbage and do not keep long ; they are in season from October to Christmas. The produce is usually sold in crates or by the tally of sixty, the very early spring variety being sold in dozens.

CARDOONS.

These closely resemble in appearance a poor type of Globe Artichoke ; they need to be taken up at the approach of frost and stored in a cool place. Much space is required to grow them, and careful cleaning is necessary before cooking to remove soil or grit.

CAULIFLOWER

So much resembles the Broccoli that advice concerning one may well apply to the other, but the former is a summer and early autumn vegetable. Its season is from May to October and later if the plants are lifted and treated as advised for Broccoli. The heads should be cut when small and not allowed to open, and if possible protect them from the sun by the foliage.

CELERY AND CELERIAC.

It is not advisable to lift the plants too long before they are used. Rough or outer leaves should be removed and the heads tied in bundles, the roots being trimmed and the top growths reduced so that when sent to market after being washed they have a neat and fresh look. With regard to quantities the bunches contain from nine to twelve and they are often sent in vans piled one upon the other. As they are tender protection is needed in severe weather, and this may be given by placing litter or dry bracken over them. Many large growers at the approach of severe weather lift considerable quantities with roots and soil attached and place in deep drills or trenches close together and cover over. In this way the plants can be examined with little trouble. The bulbous-rooted Celeriac is best lifted in November and stored like Beet. Failing this it may be clamped or covered over with litter in the growing quarters. This root is not largely grown in this country but is a great favourite in France and Germany and large quantities are imported to England in winter.

CHICORY.

Like Celeriac this is a greater favourite on the Continent than in this country. It is more often grown here as a salad plant, and if the roots are placed in a dark warm place they force readily but when used as a

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vegetable the growths are cut when a few inches long, and in this condition resemble Seakale. As the growths are very tender care is necessary in packing them as they must not be crushed. Chicory is in season from November to April. When used as a salad the plant is allowed to make a longer growth, but perfectly blanched, and should be cut over every other day.

CUCUMBERS

Should be cut young before the seed is formed. Handle the fruits as little as possible so that the bloom is preserved. The fruits are best taken from the plants daily, as by allowing too many to mature at one time a check to growth results. There is no difficulty in keeping the fruits a few days if they are placed stalk end in water. When packed in small quantities place each fruit in soft paper, but when in larger quantities pack them in flats, long fresh grass being used for packing. The Cucumber is in season all the year but is always plentiful from March until October. Fewer ridge varieties are grown now as the others are produced in immense quantities by large growers.

LEES.

Of late years these have become more popular. The best roots are those with a thick base and well blanched. The plant is quite hardy and is best dug up and used at once, though the roots if lifted, washed

and tied in bundles for the market remain good for days, but before they are used the outer skin should be removed if at all shrivelled. To prevent the plants showing their flower spikes in spring it is well to lift with roots intact and place in deep drills in moist soil on a north border. Previous to packing reduce a portion of the top growth and wash and trim the roots.

MAIZE

Is not a popular British vegetable, but when used green, that is when the cobs are fully grown but not ripe or hardened in any way, it is delicious. The cobs are in season from August to October and keep some time at this season if gathered and stored in a cool place ; they do well hung up until used.

MUSHROOMS.

The Mushroom is in season all the year but the best returns are obtained from beds made in early autumn and kept going well into the spring. To ensure the best quality there must be daily gathering and great care taken in sorting. There is a brisk demand in the London season for what are termed buttons, which are the small unfolded compact growths. They are usually packed in one pound punnets. The private grower prefers to gather Mushrooms in a more developed state known as "cookers" or "broilers". These have more flavour. In selecting the large

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Mushrooms for sale care should be taken that the growths are quite fresh and have a pretty pink colour. Those inclined to turn black realise a poorer price. Larger quantities are packed in punnets, small rounds or sieves well papered round, the Mushrooms being tightly packed with the smooth portion upwards. A good portion of stem is cut with them. If sent daily or three times a week there is no fear of stale Mushrooms and in packing cover the baskets over with paper and tie down. For private use, if sent any distance large punnets are useful, as these can be nicely packed in hampers and it is always well to be careful so that breakages do not occur. Mushrooms are very tender. Those who have caves or underground cellars can furnish supplies all the year with little trouble, and during the summer from June to October ridge-shaped beds in the open, given a good top covering with litter are reliable.

ONIONS.

Very large quantities of Onions are grown for market and home supplies, and of late years more attention has been paid to large bulbs for cooking and exhibition. The autumn sown of the Tripoli section are the mildest in flavour, but they do not keep so long as the spring sown, so that it is well to market the stock as soon as full grown. They are sold in bags. For private supplies large quantities of the green Onions are not so much required, but in market gardens they are grown for bunching when green in spring. These

are autumn sown. For storing medium-sized Onions are best, and they should be given as cool a store as possible ; indeed, if not damp or in great bulk frost does not injure them, but for home bunching or the old-fashioned plan of " roping " choose the well-ripened spring sown or keeping varieties and suspend them to the roof of a shed. If the plants are well grown and fed there will be few small bulbs ; the latter should not be mixed with the larger but they are useful for pickling and can be sold for this purpose. Large quantities of Onions are imported in late summer and greatly affect the sale of home-grown produce.

PEAS.

In no case should the pods become hard or seedy as then the flavour is poor. Gather the pods daily say from midsummer to September, and they keep a short time if laid on a floor in a cool place and damped over. Certain of the larger section, especially the light-green pods, age more quickly than others. There is now a regular trade in shelled peas early in the year, the pods being imported and then shelled and sold in bags, but this produce cannot compare with our own Marrow-fat varieties freshly gathered. Peas sent to market are usually in half sieves or bushels and early in the season from the Continent small baskets, holding a few pounds in each, are used. For home use if sent any distance they are best placed thinly in a hamper near the lid, as if in bulk any length of time they heat badly.

ROOTS.

Under this heading Carrots occupy a leading place being always in season. In private gardens where the land is suitable it is much better to have young Carrots direct from the soil and to do this three or four sowings are required. The roots are not so susceptible to weather influences as many suppose, but there are other difficulties. When left too long before lifting the roots are attacked by grub in some soils and quickly decay. It is therefore necessary to lift and store in early autumn. Give them as cool a store as possible and use plenty of soil, sand or fine ashes between the roots. Large, coarse, split or grub-eaten roots should not be stored. The tops should be cut within two inches of the crown and no washing allowed till taken from the store. They are sold in bags or by weight but the best prices are obtained in spring from roots that have wintered in their growing quarters. These are lifted, washed with tops intact, and only broken or yellow leaves removed, and tied in dozens or less. These as regards quality are preferable to stored roots. Early in the season young roots are bunched and sold in the same way.

PARSNIPS

Are best when sent to table freshly lifted from the soil. Of course this is not possible with market supplies but here a middle course can be adopted. In

October or November the roots can be lifted and stored in clamps like Potatoes, but there must be ample top covering to exclude air as parsnips shrivel badly. There can be no question whatever that the roots should be left as long as possible in the ground. In gardens the surface soil of a portion of the crop can be covered with litter to exclude frost and facilitate lifting. These roots command a better sale in severe winters than in others as they keep well, and to retard growth in spring they are best lifted and placed in trenches under a north wall. They are sold by weight mostly and are in season from October to May when given cool storage.

TURNIPS.

The best returns are obtained from early supplies which are sent to market in bunches of a dozen and later on are sold by weight in bags. It is advisable to sow at least five times during the season for home supplies, March for the early lot, August for the winter roots to store and they may be treated as advised for Beet, but avoid coarse roots which quickly decay. A Turnip loses quality if large as it soon gets soft. To get the best results it is well to sow the summer crop in a cool quarter, the late one in an open position, and to store in November. In packing, all roots should be at the bottom of the basket. If they are matured and sent with other vegetables for private use or for sale they are sent in bags or sold by weight.

SALADS.

Under this heading Lettuces form the most important item and are profitable to the large grower if early supplies are well grown. Immense quantities are imported from France in the early year in small cane baskets and are sold at a good profit. The small Cabbage Lettuces come in more quickly than the Cos. The former are usually packed flat, the heart upwards, the Cos, home grown in the summer, being laid on one side and sent in crates and baskets. To be of any value the Lettuce must be grown quickly and not allowed to remain about after it is cut. The Cos varieties are more readily packed and less likely to get broken than the Cabbage section. The plants can be kept a short time after cutting if laid on a cool floor and damped over. For home supplies they may be lifted in autumn and given frame protection, they are sold by the tally in summer and in smaller quantities early in the year.

Mustard and Cress finds a ready sale, especially in spring and winter. It is in season all the year and is sold in small punnets which are packed in boxes or hampers. In cutting take care to keep the tops upright and free from grit or soil. The best material is that grown quickly ; it should be started in the dark and cut when young.

RADISHES

Should be growing as early as possible in spring as in hot weather they soon get tough. They suffer if

much exposed after being drawn, and they are usually bunched, their tops shortened, washed and packed in flats for market. There is not much demand for autumn Radishes, but in private gardens they should find favour as a salad.

Other salads comprise Water Cress, and Corn Salad, and Endive ; the last mentioned much resembles Lettuce but remains fit for use longer if grown for the autumn supplies than Lettuce, thus being found most useful. Endive is of little value if sown too early as it runs badly. Even this is largely imported from abroad, the finely curled variety being usually grown. Owing to its tender nature in most parts of the country it is necessary to lift and place in frames for a winter supply.

POTATOES

Form such an important portion of our food supply and are always in season that they should receive special attention. The best results are obtained by growing early, mid-season and late varieties. The early Potatoes such as Ash Leaf, English Beauty, and selections from the Ash Leaf and American Earlies give the first crops, and these are best lifted as required, though when sent to market in small baskets or half bushels it is well to prevent the skins being broken as they look more presentable when intact. Soft packing will prevent this. Barrels are used for long distances but the Potatoes are not so easily seen as in baskets where more attention is paid to grading. The mid-

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season varieties are important but are a distinct class. They are sold in bags or by weight. More care is necessary with the later crop as these have to give a supply for six months. With regard to storage cool barns, sheds or out-houses are most suitable, but large growers have not sufficient space at command and are obliged to clamp. When treated in this way give the tubers a shaded position, as clamps exposed to full sunshine result in sprouting in early spring. For such purposes they are best kept in shallow trays or on shelves but allow ample ventilation. The tubers then make a short thick sprout. In no case should Potatoes be unduly exposed after lifting as green colouring is injurious. When they are merely for seed it is not necessary that the tubers should be dry when stored provided there are no decaying ones. When packing small quantities of early tubers punnets are used, and bags for late varieties, in quantities often by the hundredweight.

SALSIFY AND SCORZONERA.

These vegetables are in season from October until April. It is advisable to leave the roots in their growing quarters and lift as required for use, and to prevent growth in early spring lift and treat as advised for Leeks. There is only a limited sale for these roots and they are best tied up in a dozen to a bundle, the tops shortened and care taken in packing. They may be wintered in heavy land in a store using plenty of soil between the roots.

SEAKALE.

A very popular winter and spring vegetable and finding a ready sale when well grown. Large growers who make a speciality of this vegetable have different methods from the private grower as the latter needs smaller quantities. To get tender Seakale it must be grown quickly in the dark, and use only strong growths. It will be found that Seakale grown with too much heat from hot-water pipes or fire heat is not so rich in flavour as that from the open ground forced with manures. The Kale should be compact and neither too long nor show the flower stem in any way, that is, the centres should not be fully expanded. It is well to cut a small portion of the root with each growth and tie in bundles of say half a dozen or more. To keep the Kale fresh place it in shallow pans of water in a quite cool and dark place. Exposure to light or too much ventilation results in a soft growth. For home supplies it is much better cut and used in a fresh state. If packed soft paper should completely cover the bundles. For sale the Kale is often placed in punnets and packed in boxes or baskets.

SPINACH.

This vegetable is in season all the year but there is often a short supply in early spring as severe weather cripples the growth. It produces freely in the spring given good culture, and again in the late summer or

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early autumn months when the large succulent leaves are much enjoyed. To get these a rich root run and severe thinning are necessary. When cut it should be used quickly, and is useful as a "packing" when sending other vegetables.

RHUBARB.

This is in great demand from January to May and is largely grown for market. The early forced Rhubarb is most liked in private gardens. It is grown in a dark place to give the bright colour so much liked and is also forced largely for sale, two or three stalks with a good portion of the leaves being tied together. Larger bundles are made later on and sent in crates or baskets, or whole van loads are packed up at one time. The varieties differ as regards colour, the Champagne being a market favourite.

TOMATOES.

These should be quite fresh though they keep a long time if not dead ripe or at all damaged. A smooth even well-coloured Tomato is better than a large ribbed one. Many force Tomatoes under glass for spring and these give by far the best return though it is only fair to state that the best-flavoured fruits are those grown under glass without heat and that ripen from July to September. Many gather the fruits before they are at all ripe but this means

poor quality, as though they ripen they are less juicy. For sending in quantities to market the fruits must not be over-ripe, and they should be as much as possible of one size, that is carefully graded and sent in cross-handled baskets with paper round the sides and over the fruits, ten to twelve lbs. weight being in a basket. Later on they are sold in half sieves, bushels and flats and the fruit in all cases is just below the rim of the basket or flat so that pressure is avoided. Taking the imported fruits into account Tomatoes are in season all the year. The late full-grown fruits in autumn keep a long time if stored on a cool dry shelf and gathered whilst green. Soft fruits, those that bruise easily, are not liked in the market, they must be firm though well coloured. Open-air fruits will often be fully ripe on one side and not the unexposed half. These need care in marketing and well repay housing for a few days till ripe. It is a good plan to go over both forced and open-air fruits daily and place in single layers in boxes which should be transferred to a warm house but not on hot shelves as this causes shrivelling. The yellow varieties are not favourites in the market but for home supplies they are excellent in salads and of rich flavour. The small unripened green fruits are useful for making into pickles and are much liked when mixed with other things for making Chutney. Some small Plum and Currant-shaped varieties are of excellent quality and make a useful addition to the salad bowl but are useless for cooking.

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VEGETABLE MARROWS, GOURDS AND SQUASHES.

In private gardens the Vegetable Marrow is always welcome as it is a wholesome addition to the green vegetables. Unfortunately it is very tender and this in cold seasons makes the fruit later. The same advice as regards the gathering in private gardens does not apply to the market grower who requires large fruits with firmly set skins that do not bruise. Considerable room is required also in packing. On the other hand if quality is considered the fruits should not be allowed to harden or partially mature their seeds but be cut in a much younger state and cooked whole without being even peeled. Full-grown fruits are dry and mealy, but when young make a much nicer dish. There is no loss by early cutting as if the fruits are allowed to get big there is a smaller crop. The fruits keep good for some days in a cool place, but put the stalk end in water or in damp moss. Large fruits are much liked in manufacturing towns and they are made into jams and compôtes not unlike preserved ginger. They are sent to market in crates and early in the season in flat baskets, the long green and white kinds being the most largely grown. Very large fruits are kept for winter use. By hanging them up in dry rooms they keep good for a long time.

Much the same treatment is required to grow Gourds and Pumpkins. The edible varieties are quite as useful in a young state, and when fully grown are used in a similar way. Some varieties attain a great

weight, and they are much more grown in the United States than in this country.

HERBS.

For home supplies herbs are in most demand in a green state and in packing vegetables it is always important to place small quantities in the basket for use with other things. Mint is largely used in the spring, and this to be good should be fresh and always obtained from young plants, as these give a much stronger growth. Sweet and Bush Basil are favourite herbs, and like Mint find a ready sale in the market, but they are not so readily forced as Mint, which is largely grown in market gardens. Basil is a summer herb but may be had in a dried state for winter supplies ; it is not hardy in this country. Other herbs such as Thyme, Marjoram, Sage and Tarragon, should be cut when nearly full grown, tied in small bunches and hung up in a cool shed for use when dry. Parsley is an evergreen and should be grown in quantities, being always in season. Sown in the early spring and again in August there will be a regular supply if not grown too thickly. This is useful cut and dried at the end of the summer. Other herbs such as Borage, Fennel, Chives and Chervil are not required so much but should be grown in small quantities.

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